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Chapter 1

Introduction

The thesis will address the issue of working age population (economically active and inactive population) of Kazakhstan during the period of economic growth in 1999–2007. It will provide general definitions, indicators, and explanations related to demographic conditions of working age population in and out of the labor force. Hereafter, the main aim, goals and the structure of master's thesis will be presented.

1.1 Problem definition

Recently observed changes in the structure of population have been also accompanied by shifts in the size of working age population. The proportion of working age population aged 16-64 in Kazakhstan increased from 64.6% (or 9.6 million people) in 1999 to 68.2% (or 10.5 million people) in 2007. The distribution of working age population by regions of Kazakhstan has not been uniform. We can observe the regions of Kazakhstan with higher and lower proportions of working age population. For example, in 2007 the Southern Kazakhstan region had the highest number of the total population (2.3 million people) with the highest number of population aged 16-64 (1.4 million people) and employed population aged 16-64 (1.01 million people) in comparison with other regions of Kazakhstan in absolute numbers. However, the highest working age employment rate – 82.6% has been observed in Qostanay region whereas in Southern Kazakhstan region this rate was equal to 70.7%. The lowest number of total population (390.5 thousand people), the lowest number of population aged 16-64 (258.3 thousand people) and employed population aged 16-64 (177.8 thousand people) were observed in Manghystau region while the minimum working age employment rate (66.5%) was noted in Astana city. The highest unemployment rate was observed in Manghystau region (8.8%) and the lowest – in Eastern Kazakhstan region (6.6%).

Disparities in regional developments of Kazakhstan including the levels of employment, unemployment and inactivity, and disparities in the size and structure of working age population make our research topic more relevant to Kazakhstan.

1.2 Aim and goals of the research

The aim of this thesis is to examine the working age population, i.e., economically active (employed and unemployed) and inactive population. The research will be held within the framework of the current demographic patterns in Kazakhstan primarily focusing on the period 1999–2007 using different tools and methods. In line with the main aim of the master's thesis, the main goals of this thesis are the following:

– to consider the distribution of working population by sex, age, place of residence, and regional dimensions of Kazakhstan;

– to study the working age population of Kazakhstan considering the economically active (employed and unemployed) and inactive population by sex, age, educational level, place of resident, and regional dimensions;

– to examine and compare economic activity, employment, unemployment, and economic inactivity rates by sex, age, educational level, place of resident, and regional dimensions;

– to make calculations of working life expectancy for employed, unemployed and inactive males and females based on population and labor-force measurements, and also to make calculations of accessions to and separations from the labor force by age and sex;

– to make calculations of temporary working life expectancy for employed, unemployed and inactive males and females using Arriaga's method.

1.3 Structure of research

Due to the topic of this research as well as to the definition of the problem, this master's thesis will be divided into eleven parts. In the first part a problem definition, the aim, goals and the structure will be introduced. The second and third parts will be focused on literature overview and labor force concept. The fourth, fifth and sixth parts will be dedicated to the information about research questions and hypotheses, data sources, and research methods. The aim of the seventh part is to provide information and analytical findings related to the working age population and its development. The eighth and ninth parts will deal with economically active and inactive population by sex, age, educational level, place of resident and regional dimensions, and also calculation of economic activity, employment, unemployment and inactivity rates by sex, age, educational level, and place of resident. The tenth part will be connected with the calculation of the main indicators of working life tables for employed, unemployed and inactive males and females. The final part will present conclusion and discussion related to the topic and research questions. Lists of tables, figures and references will be included.

Chapter 2

Literature overview

There is a wide choice of literatures related to the economically active (employed and unemployed) and inactive population. The labor legislation is one of the main legal documents where definitions, concepts, terms and conditions that occur in the labor market are given. For example, in Kazakhstan, the labor relations are regulated by the regulatory legal measurements and instruments, individual contract of employment and, if one exists, a collective labor agreement. The labor laws and regulations are based on the Constitution of the Republic of Kazakhstan and include the Labor Law, the Law on Collective Agreements and other legal instruments, which regulate labor relations of some separate categories of the employees. The major sources of labor legislation are laws adopted by the Parliament of Kazakhstan, and technical acts passed by the governmental agencies.

According to the Article 3 of the Labor Law, the labor law regulations in Kazakhstan are applicable to all workers who have entered into employment relations with employers. The most important legal enactment, which regulates labor relations in Kazakhstan, is the Labor Law of 1999, which came into force on the 1st January 2000 and replaced the amended old Labor Code dating from 1972. The Law regulates social relations arising in the course of implementation of the citizen's constitutional right to the freedom of labor, stipulated in Article 24 of the Constitution of the Republic of Kazakhstan. The Labor Law consists of 12 chapters and 109 articles (Kryvoi 2006).

The minimum age for conclusion of a contract of employment is differing for the various countries, for example, age 15 for Germany and Canada and age 16 for United States and France (Seigel 2002); and in case of Kazakhstan, age 16 (International Labor Office 2001). The retirement age in Kazakhstan is 58 years old for females and 63 years old for males whereas in UK and Italy – 60 years old and 65 years old, respectively (Makarova 2009).

There are also a number of other legal acts, which regulate the labor and industrial relations, not covered by the Labor Law, such as the Law on Collective Labor Disputes and Strikes, the Law on Collective Agreements, the Law on the Occupation of the Population, the

Edict on Approving a Position on Qualification Classes of State Employees, the Law on Employment of Population, and the Law on State Service (Kryvoi 2006).

The international treaties ratified by Kazakhstan prevail over the Labor Law and other regulatory legal instruments for labor, and are applied directly except in cases where the international treaty implies that its application demands publication of a corresponding law of the Republic of Kazakhstan (ibid). The labor law regulations in Kazakhstan are also applicable to employment relationships with foreigners and persons without citizenship, unless otherwise provided by a federal law or an international treaty of Kazakhstan (ibid).

In his paper Seigel (2002) points that according to the labor force concept, the labor force includes all persons at work or with a job (i.e., employed and self-employed) and persons without a job but actively seeking the job (i.e., unemployed) during a reference week. The United States Census has been using the labor force concept since the 1940 census. The International Labor Office seeks to compile data on the economically active population of various countries. The Office of Economic Cooperation and Development (OECD) employ a labor force concept similar to that of the United States (ibid). In case of Kazakhstan, it adheres to the concept which has been suggested by the International Labor Office (Agency of Statistics of the Republic of Kazakhstan 2008a).

There are many types of labor force. The nation has its labor force, as does each region of the country, each state, and each metropolitan does. The labor force may also be defined for different types of organizations (e.g. charitable organizations, professional associations), specific industries (e.g. agriculture, constructions), specific companies (e.g. General Motors Corporation) (Seigel 2002), and specific form of ownership (e.g. private, government). The labor force can be identified by occupational groups. For example, nurses, automobile plant workers, homemakers, volunteer workers, and more specifically, such workers at particular installations or in particular geographic areas. It should be noted that some of these groups – homemakers and volunteer workers – are not part of the official labor force because they are not paid, but they contribute to the economy by virtue of their considerable volume of work (ibid).

The size of the labor force is an indicator of considerable interest to demographers. For example, Bauer (1990) in Sullivan (2005) reports that relatively large labor force indicates a large number of productive people to support the dependent population, and relatively small labor force may indicates higher levels of dependency, either because the age structure is relatively young or old, or because many people in the usual working ages are unable or unwilling to work.

The composition of the labor force is also interesting. For example, Sullivan (2005) has argued that when a labor force is evenly divided between males and females, the population may have different norms about sex roles and lower fertility rates than a population whose labor force is predominantly male. Clark *et al.* (1991) in Sullivan (2005) note that the higher levels of economic development are typically associated with a large share of female workers.

Odland (2001) and Willekens (1979) in Sullivan (2005) notes that the accession rates of new workers and separation rates from the labor force due to mortality and retirement are the

greatest indicators which can influence on the size and structure of labor force. The most commonly used measure for comparative labor force studies is labor force participation rate (or economic activity rate), which is defined as the number of eligible people in the labor force (employed or unemployed) divided by the number of people of working age eligible to be in the labor force, and evaluated for a specific time and place. Labor force participation rates can be used in multiple increment-decrement tables to model not only the effect of mortality but also the effect of entry and exit into the labor force on the expectation of economically active life. This measure can be interpreted as the expected length of working life if current age-specific labor force participation and mortality rates persist indefinitely. These measures are useful for predicting future labor supply and for making decisions concerning, for example, the instrument of pension funds (Sullivan 2005).

In case of inactive population, many sources, mainly reports of statistical agencies define economically inactive population as population that not in the labor force who are neither employed, nor unemployed during the reference period (National Statistical Institute of the Republic of Bulgaria 2009). Specific categories of those who are economically inactive are: retires, students, looking after family/home, permanently sick/disabled and others. A person who is looking for a job but is not available to start work within two weeks is also counted as economically inactive (Royal Borough of Windsor and Maidenhead 2004).

Chapter 3

Labor force concept

The Agency of Statistics of the Republic of Kazakhstan has developed a framework for labor force statistics to describe the major concepts that exist within the labor market and their relationship to each other. This approach has wide international acceptance, including by the International Labor Organization (UK Office for National Statistics 2008a).

According to labor force approach all respondents aged 16 years and over asked to state whether they were working during the reference period, and if not, whether they were actively looking for a job. Working is defined as being engaged in the production of goods and services. All those who were identified as working and actively looking for a job were considered as economically active and included in the labor force, while the other were included in the economically inactive population (or not in the labor force) (Swee-Hock 2007).

The labor force concept classifies the working age population into three categories: employed, unemployed and not in the labor force. The employed and unemployed categories together make up the labor force which gives a measure of the number of persons furnishing the supply of labor at a given moment in time (Hussmanns *et al.* 1992). The labor force concept is shown graphically in the Figure 1.

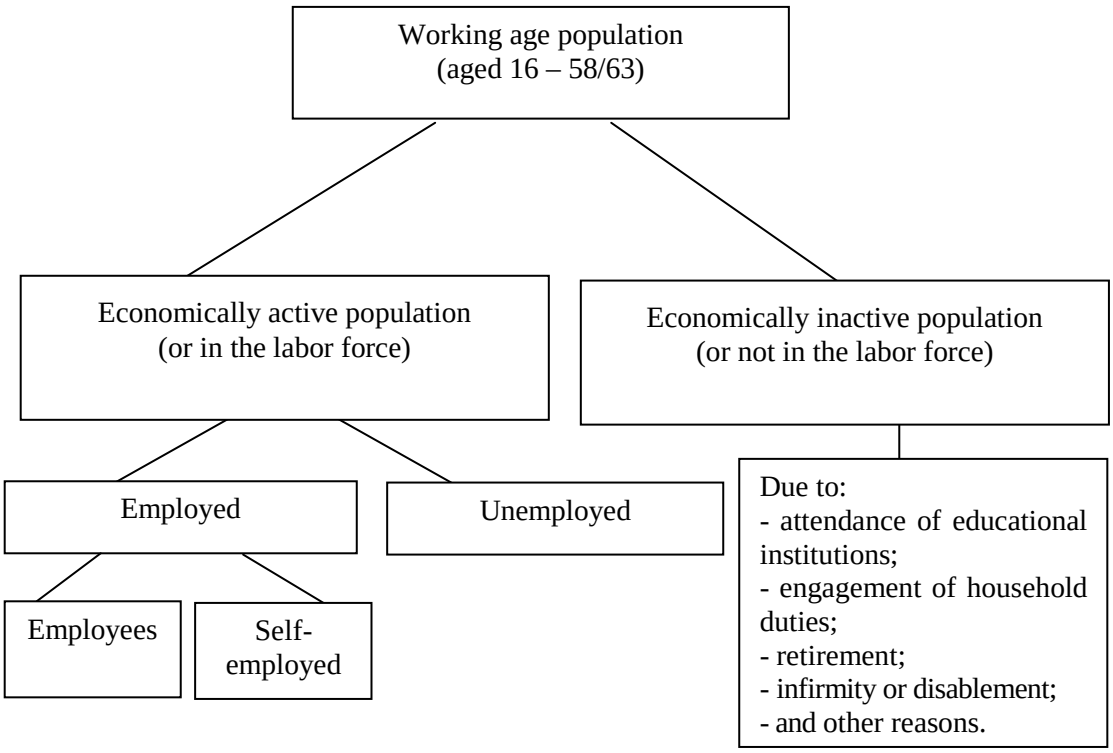
3.1 Definitions of concept

According to the methodological part of conducting Labor Force Survey which is organized by the Agency of the Republic of Kazakhstan, all definitions concerning to the labor force concept based on standards and methodological recommendations of International Labor Organization.

The *working age population* covers males at the age of 16 to 63 years old and females at the age of 16 to 58 years old.

Economically active population (or labor force) consists of all persons who aged from 16 to 63 years for males and form 16 to 58 years for females and who were employed or unemployed during a reference week.

***Figure 1** – Labor force concept*



SOURCE: Accessed at <<http://books.google.com>> in November 19, 2009.

Employed are persons:

– aged from 16 to 63 years for males and form 16 to 58 years for females;

– who performed work during the reference week at least hour per week for pay, profit or family gain;

– who were not at work but had a job or business from which they were temporarily absent because of, e.g., illness, holidays, maternity leave or education and training.

Employees are persons who are working under the contract for payment (in cash or in kind). The employees could be employed in government, private, individual and farm organizations.

Self-employed are persons who could be classified as following:

– employers are persons who manage their own enterprise or engaged in independent entrepreneurship in any economic activity and have one or more employees;

– own-account workers comprise persons who, while working independently or with one or more partners, are engaged in self-employment and do not hire other workers on a constant basis;

– unpaid family workers are persons who work without payment in a family business or farm which is managed by their relative person (housewives excluded from this definition);

– members of producers' cooperative include persons who are members of labor cooperative which is engaged in entrepreneur activity.

Unemployed are persons:

– aged from 16 to 63 years for males and form 16 to 58 years for females;

– who were without job during the reference week;

– who were currently available for work during the reference week (Agency of Statistics of the Republic of Kazakhstan 2008; Malta's National Statistical Office 1995). Persons who already had found a job which was to start later are also classified as unemployed (European Commission 2002).

Economically inactive population (or not in the labor force) consists of all persons who aged 16-63 (males aged 16-63 and females aged 16-58) and who neither classified as employed nor as unemployed during the reference week (Agency of Statistics of the Republic of Kazakhstan 2008a). Among the important categories of the inactive population are those who are attendant of educational institutions, engage of household duties, retired before the state pension, sick and disable. Unpaid voluntary social workers, inmates of penal, mental and charitable institutions, persons deriving their income from rent, dividend, and interest are also included in the economically inactive population (Swee-Hock 2007).

The European Commission in 2002 had been further specified the definition of the labor status in a number of points:

– persons who work on their own small agricultural farm, but produce only for their own consumption, should be considered as employed only if this production is included in national accounts;

– conscripts who performed some work for pay or profit during the reference week should not be considered as employed;

– persons on maternity leave should always be considered as employed;

– others not at work during the reference week (seasonal workers, during the off-season, persons on parental leave, unpaid family workers, lay-offs and persons on long-term absence except due to illness) should be considered as employed only if they have an assurance to return to work within a period of three months or continue to receive 50% or more of their salary;

– persons who were not employed during the reference week but already had found a job starting later should be considered as unemployed only if the starting date for that job was within a period of at most three months and inactive otherwise (European Commission 2002).

As a conclusion we may add that the classification of working age population by categories of employed, unemployed and economically inactive population is very important information for the present and future engage in the process of the production goods and services, and whole economic growth of the country. We briefly analyzed labor force concept, gave the main definitions of terms such as "working age population", "economically active population (or labor force)", "employed", "unemployed" and "economically inactive population (or not in the labor force)".

Chapter 4

Research questions and hypotheses

This section will focus on the research questions and hypotheses. The Research Assistance (2003) defines research question as a statement that identifies the phenomenon to be studied while the hypotheses are more specific predictions about the nature and direction of the relationship between two variables. All given research hypotheses must be proved or rejected during our research. In case of research questions, the answers will be given in the discussion's part of master's thesis.

4.1 Research questions

The main research questions are:

1. How did the size of working age population change during the considered period from 1999 to 2007?
2. What were the trends in the development of economically active and inactive population during the 1999–2007? Did they increase or decrease?
3. Did the economic activity and inactivity rates depend on sex and age structure of working population during the considered period?
4. Were there any differences in working life expectancy according to sex in 2003 and 2007?
5. Were there any differences in the reason of separation from the labor force for males and females during the considered period?

4.2 Research hypotheses

Based on research questions the following hypotheses will be stated:

1. The size of working age population increased during the considered period from 1999 to 2007.

2. The trends of economically active and inactive population had an increasing tendency during 1999–2007.

3. The economic activity and inactivity rates did not depend on sex and age structure of working population during the considered period.

4. The working life expectancy was higher for males than females in 2003 and 2007.

5. There were no any differences in the reasons of separation from the labor force for males and females during the considered period.

Chapter 5

Data sources

The Agency of Statistics of the Republic of Kazakhstan is the authorized body forming and realizing the state policy in statistics, developing and carrying out programs on statistics in Kazakhstan (Agency of Statistics of the Republic of Kazakhstan 2008b). The Agency of Statistics has in its submission 14 regional and 2 municipal departments of statistics (in Astana and Almaty cities) which are also responsible for realization of state policy in the field of state statistics; provide accumulation, conducting and actualization of information – statistical databases about economic and social situation of region; conducts the state statistical registers according to the international standards; carries out the analysis about economic and social situation of region, publishes and extends statistical collections, bulletins, economic reviews and other statistical materials (Agency of Statistics of the Republic of Kazakhstan 2008c).

It is very important to note that since 2001 the Agency of Statistics of Kazakhstan conducts a quarterly sample survey related to the labor force statistics. This sample survey is called the Labor Force Survey (LFS) and purposes to provide information on Kazakhstan labor market which can be used to develop, manage, evaluate and report on labor market policies. The Agency of Statistics is responsible for the questionnaire design, sample selection, and interviewing, and publishes full LFS results (UN Office for National Statistics 2008b).

The main objective of the LFS is to divide the working age population into tree mutually exclusive classifications – employed, unemployed, and not in the labor force – and to provide descriptive and explanatory data on each of these. LFS data are used to produce the well-known unemployment rate as well as employment rate and labor force participation rate (or economic activity rate). The LFS also provides employment and unemployment estimates by industry, occupation, public and private sectors, and much more, all cross-classified by a variety of demographic characteristics (Statistics Canada 2009).

In case of the international data sources on employment, it is possible to find this kind of information in the ILO database on Labor Statistics (LABORSTA), the World Development Indicators (WDI) computed by the World Bank and others (Cling *et al.* 2007).

When we analyzed the working age population we based the analysis on the following official publications of Statistical Agency:

1. The Demographic Yearbook which disseminates statistics on population size and composition, births, deaths, marriage and divorce on an annual basis. Demographic Yearbook special topics issues cover a wide range of additional topics including economic activity, educational attainment, household characteristics, housing, ethnicity and language, among others (United Nations Statistics Division 2009).

2. The Regions of Kazakhstan publication consist of 24 parts. From this publication we are interested in general statistical review of regions, and Astana and Almaty cities; statistics on the size, distribution and trends of population by regions, and Astana and Almaty cities; employed by regions, and Astana and Almaty cities (Meshimbaeva 2008a).

3. The Economic Activity of Population which provides with data about working age population (economically active and inactive population) by sex, age, educational level, and regions including urban and rural places of residence (Meshimbaeva 2008b).

The information and data on working age population were taken from these publications by the following parameters:

– period: 1999–2007;

– sex: males, females, total population;

– age: from 16 to 64 years old for males, and from 15 to 58 years old for females;

– categories of population: employed, unemployed and inactive;

– place of residence: urban, rural, and regions of Kazakhstan.

In spite of the fact that the Agency of Statistics of Kazakhstan initiated to conduct Labor Force Survey since 2001, the data about the working age population (males aged 16-63 and females 16-58) by sex, age, educational level, place of residence, and regional dimensions have been available only since 2003. That is why, when we analyze the economically active (i.e., employed and unemployed) and inactive population we were based on data from 2003 to 2007. The working life tables for males aged 16-63 and females aged 16-58 of Kazakhstan, and the rates of accession to, and separation from, the labor force also will be constructed according to the data 2003-2007.

According to the United States of America Census Bureau (2006), data must possess three attributes of quality: *utility* – refers to the usefulness of the information for its intended users; *objectivity* – refers to whether information is accurate, reliable, and unbiased, and is presented in an accurate, clear, and unbiased manner; *integrity* – refers to the security or protection of information from unauthorized access or revision. To help apply data the best, the United States of America Census Bureau further defines utility, objectivity, and integrity in terms of fifth dimensions of data quality: relevance, accuracy, timeliness, accessibility, interpretability (ibid).

Relevance of statistical information refers to the degree to which data provide information that meets customers' needs. *Accuracy* refers to the difference between an estimate of a parameter and its true value. *Timeliness* refers to the length of time between the reference

periods of the information. *Accessibility* refers to the ease with which customers can identify, obtain, and use the information. *Interpretability* refers to the availability of documentation to aid customers in understanding and using data. This documentation typically includes: the underlying concepts; definitions; the methods used to collect, process, and analyze the data; and the limitations imposed by the methods used (United States of America Census Bureau 2006).

Thus, a conduction of LFS by Statistical Agency is very necessary and important method to getting information and data about labor force. It helps to make labor force data more visible, improve client access to the labor force data, and increase availability of labor force data in electronic formats (Australian Government Initiative 2001).

Chapter 6

Research methods

The section about the research methods is one of the important parts of master's thesis because it helps to analyze and explains us how the results of the study were achieved. That is why; this section will be dedicated to the main assessments of working age population and working life table's measurements.

6.1 Working age population's assessments

As we noted before in the section about the labor force concept, the working age population consist of economically active and inactive population. There are several measurements which we will need to analyze the working age population by these categories.

1. The economically active population (or labor force) consists of employed and unemployed persons who are at age 16-63 for males and 16-58 for females.

The *labor force* is the number of people employed and unemployed:

$$Labor\ \ force = Employed + Unemployed\ .$$

The labor force participation rate is the ratio between the number of people in the labor force and the total population.

$$Labor\ \ force\ participation\ rate = \frac{Labor\ \ force}{Total\ \ population} * 100\%\ .$$

The employment rate is the proportion of the total number of employed persons to the total number of persons in the labor force.

$$Employment\ rate = \frac{Employed}{Labor\ \ force} * 100\%\ .$$

The unemployment rate is the proportion of the total number of unemployed persons to the total number of persons in the labor force.

$$Unemployment\ rate = \frac{Unemployed}{Labor\ \ force} * 100\%$$ (Philippine National Statistical Coordination Board 2009).

The labor force participation rate can decrease when the rate of growth of the population outweighs that employed and unemployed together. The labor force participation rate explains how an increase in the unemployment rate can occur simultaneously with an increase employment. If a large number of new workers enter the labor force but only a small fraction of them become employed, then the increase in the number of unemployed worker can outpace the growth in employment. The labor force participation rate is the main key component of economic growth and almost important as productivity (Wikipedia 2009a).

2. Apart from the employed and unemployed there is another part of population who are not regarded as labor force and consequently they are economically inactive (Baltic Course 2009). This includes students, home-makers, the sick and disabled, retired and people who are not in work or have looked for a job (Skills and Learning Intelligence Module 2009). The main indicator of measuring inactivity is an economic inactivity rate which is calculated as:

$$Economic\ inactivity\ rate = \frac{Inactive\ population}{Total\ \ population} * 100\%$$

6.2 Working life table's measurements

Many economists, sociologists, demographers and other scientists were interested in concept of working life table in 18th century. One of the pioneering systematic studies of estimating the duration of productive life known to this writer was done in 1908 by Georgio Mortara in Italy. Forty–three years latter G. Mortara presented data on the relationship between total life table span and work life span in 34 countries in his "Durée de la Vie Economiquement Active suivant la Mortalité". Concern with the measurement and analysis of the structure of working life has become practically world wide in more recent times and has received valuable treatment by authors in many countries. Seven years ago, he constructed a series of working life tables in the United States. These tables of working life were very similar to the standard life tables. The life table is a statistical or actuarial device for summarizing the mortality experience of a population of some particular period of time. For this purpose, the life table starts with the group of persons – usually 100,000 – born alive and follows it through successive ages as it experiences the attrition caused by death. A number of significant measures can be obtained from such a table, the most familiar of which is "life expectancy" – the average number of years of life remaining after each specified age. The tables of working life also follow through successive ages the experience of an initial cohort of 100,000 at birth. In addition, to showing the attrition caused by mortality, however, they also show the number of persons who may be expected to work or seek work over their life span. From these materials, it is possible to find the rates at which persons enter and exit from the labor force, and to calculate a "working life expectancy" – the average

years of labor force activity remaining after each specified age. The contrast of life and working life expectancies also yields of important measure of the interaction of these two primary variables. Other countries already have or are in the process of constructing similar working life tables and international comparisons of working life are becoming possible on a more extensive basis (Wolfbein 1957).

Wolfbein (1949), Duran and Miller (1968), Fullerton (1971) in Willekens (1980) assume the unrealistic assumptions on which this technique for constructing working life table is based and to how they may affect the results. It is only recently that one observes methodological innovations. Hoem and Fong (1976) in Willekens (1980) have developed a working life table which does not rely on the unrealistic assumptions required in conventional working life tables in 1976. It is multistate increment-decrement life table which explicitly incorporates the gross flows of people between active and inactive life.

The conventional method for constructing working life tables which was used in this master thesis is generally adopting three additional general assumptions.

1. Persons who enter the labor force do so prior to the age at which the activity rate reaches its maximum. This implies that the labor force participation schedule has a maximum, that is, is unimodal.

2. Prior to the age of maximum labor force participation, no survivors retire from the labor force and become member of the inactive population. Retirement only occurs at ages beyond the age of the maximum activity rate. Once a person has left the labor force, he can never return.

3. The rates of mortality at each age are the same for economically active and inactive persons.

The first two assumptions are used for males but not for females. The male's labor force participation curve has a very regular pattern: labor force participation starts at about the age of fifteen and reaches a peak around the age of thirty. Between the mid – thirties and the mid – forties the proportion of the male population in the labor force drops gradually, and then declines rapidly due to retirement. But the female's labor force participation curve has an irregular pattern due to the fact that they can entry into the labor force and of withdrawal or retirement, which are related to the life cycle of marriage and fertility. The problem of bimodality of female's labor force participation curves may be eliminated by constructing working life tables for women by marital status.

The third assumption is generally not true, since the age-specific mortality rates of an active population generally exceeds that of an inactive population. All there assumptions may be dropped by constructing multistate tables of working life (Willekens 1980).

The following is a very brief description of each of the columns appearing in the accompanying tables of working life for males and females. Some of the functions normally included in the standard of life table, for example, $M(x)$ – age-specific mortality rate, $q(x)$ – probability of dying, lx – number of persons alive at exact age x, $d(x)$ – number of persons dying between exact age x are omitted in the interest of compactness. They can readily be derived from the tables.

1. *Number of persons living, L(x)*

This is the "stationary population" or number of persons who would be living in any age interval under the assumption of 100,000 live births annually, subject throughout life to the specified mortality rate. Under these fixed conditions, if births were distributed evenly throughout each year and if there were no migration, a census taken at any time would always show the same total population and the same number of persons in each age interval (Wolfbein 1957).

2. *Number of persons in the labor force,* $L^w(x)$

The age composition of the labor force in the stationary population is derived as the product

$$L^w(x) = w(x)\,L(x),$$

where *w(x)* is the age-specific activity rate. Note that $L^w(x)$ also represents the expected time spent in active life between ages *x* and *x+1* by the cohort (Willekens 1980).

3. *Total persons-years lived in the labor force beyond age x,* $T^w(x)$

$$T^w(x) = \sum_{y=x}^{z} L^w(y),$$

where *z* denotes the final age interval. It is the total expected time spent in active life beyond age *x* by the cohort of 100,000 people. The variable $T^w(x)$ is analogous to the total person-years lived beyond age x in the conventional life tables (ibid).

4. *Expectation of working life,* $e^w(x)$

The average remaining number of years of working life or the expectation of working life beyond age *x* is

$$e^w(x) = \left[\sum_{y=x}^{z} L^w(y)\right]\left[l^w(x)\right]^{-1}.$$

It defines the average number of years of working life remaining to a person *in the labor force* at exact age *x*. The value of $l^w(x)$ is computed as follows: if *w(k)* is the maximum labor force participation rate, attained at age *k*, then the value of $l^w(x)$ is given by

$$l^w(x) = \frac{1}{2}\left[L^w(x-1) + L^w(x)\right], \qquad \text{for } x > k,$$

and by

$$l^w(x) = \frac{1}{2}\left[L(x-1) + L(x)\right]w(k), \qquad \text{for } x \le k.$$

The consideration of the maximum activity rate for ages below or equal to *k* is made to eliminate the effect of entries into the labor force in years following age *x*. The working life expectancy at age *x* refers to the cohort of active population $l^w(x)$. Therefore additional entries into the labor force after *x* may not be considered. The implicit assumption is that all work is done by a distinct cohort of workers. The application of *w(k)* for $x \le k$ reflects the assumption that all entries into the labor force occur at the youngest labor force age, α (sixteen years say). Between ages α and *k*, no person is supposed to leave the labor force (second assumption).

Hence the active population of exact age k is smaller than at age α only because of mortality in the intervening years (Willekens 1980).

We used two measurements of calculation of working life tables. The first, *labor-force-based measurement* is identical to $e^w(x)$ and is sometimes called the *average remaining number of years of active life*. The second, the *population-based measurement*, is the ratio $\left[\sum_{y=x}^{z} L^w(y)\right]\left[l(x)\right]^{-1}$, where *l(x)* is the total number of people of exact age *x* in the life table, and is known as the *expectation of active life*. The second measurement assumes that all persons in the population, currently active or inactive, have an equal probability of participating in the labor force. The two measures serve different purposes, if one is interested in the working life expectancy of a person not yet in the labor force while the another one – in the remaining years of work of a currently active person. For example, the expected length of working life at birth is

$$e^w(0) = \left[\sum_{y=0}^{z} L^w(y)\right]\left[l(0)^{-1}\right].$$

5. *Rate of accession to the labor force, A(x)*

This measure shows the net accessions to the life table labor force between ages *x* to *x+1* as a ratio of the life table population, *L(x)*. It gives the proportion of the population aged *x* to *x+1* in a life table cohort who are not currently in the labor force but who will engage in labor activity in the next year. Wolfbein (1949) in Willekens (1980) suggest to calculate the ratio of the net accession to the life table labor force as

$$A(x) = \frac{L^w(x+1) - L^w(x)\left[1 - M(x)\right]}{L(x)},$$

where *M(x)* is the age-specific mortality rate, and the product $L^w(x)\left[1 - M(x)\right]$ is the mortality in the labor force between ages *x* and *x+1*. The quantity *A(x)* is not computed for ages above *k*, since it has been assumed that people enter the labor force only up to age *k*, at which age the labor force participation is at its maximum (ibid).

6. *Rate of separation from the labor force,* $M^w(x)$

The rate of separation from the labor force due to all causes (mortality and retirement) is defined as the ratio of the net separation from the labor force between ages *x* and *x+1* to the stationary labor force, $L^w(x)$:

$$M^w(x) = \frac{l^w(x) - l^w(x+1)}{L^w(x)}.$$

This measure is very similar to the death rate in a conventional life table. Before the age *k* it is assumed that withdrawal from the labor force is due to mortality only. After age k, two types of separation occur: mortality and retirement. The rate of separation due to mortality is

$$M_{\delta}^{w}(x) = \frac{l^w(x)\, q(x)}{L^w(x)},$$

where *q(x)* is the probability of dying between ages *x* and *x+1* (identical for an active and an inactive population). The rate of separation due to retirement is a residual:

$$M_r^w(x) = M^w(x) - M_\delta^w(x).$$

Separation rates are important for manpower planning because they permit the calculation of expected losses from active life due to death and retirement (Willekens 1980).

For the calculation temporary working life expectancy (life expectancies between two specific ages) we used the method which was introduced by E.E. Arriaga. The temporary working life expectancy form age *x* to *x+ i* is the average number of years that a group of persons alive at exact age x will be in the labor force form age *x* to *x+ i* years, and in symbols,

$${}_i e_x = \frac{T_x - T_{x+i}}{l_x}$$ (Arriaga 1984).

For example, in our case *x* = 16 and *i* = 64, then the temporary working life expectancy would be from age 16 to 64.

To conclude, a typical working life table represents the life history of a hypothetical population or cohort, and it describes the pattern of labor force participation. All the columns are derived by applying the mortality rates and labor force participation rates (or economic activity rates) to a hypothetical population or cohort (Willekens 1980). Using working life tables we deal with the duration of that part of a person's total life span spent in labor force activity. Involved here such key factors as the age at which young people enter the labor force; the time they spend on education and training to prepare themselves for labor force activity; and the age at which males and females exit from the labor force. The length of working life is also a major determinant of the manpower potential of a population (Wolfbein 1957).

Chapter 7

Working age population and its development

This section will focus on the trends in the working age population, and age and sex structure of working population from 1999 to 2007 in Kazakhstan.

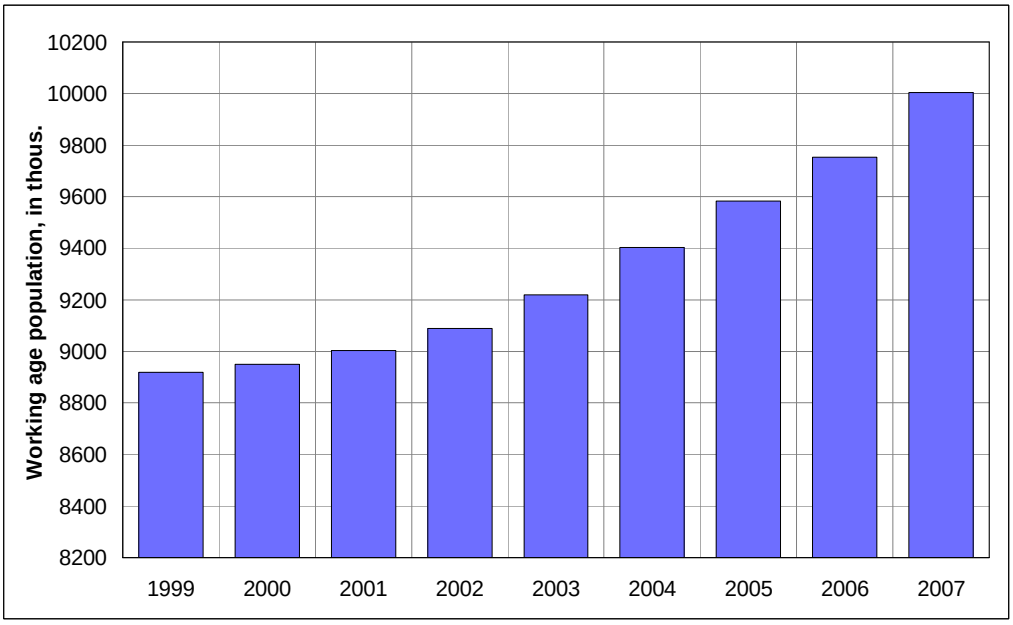
7.1 Trends in the working age population

The working age population of Kazakhstan consists of individuals who aged from 16 to 63 years old for males and from 16 to 58 years old for females. The working age population is a subset of total population, and the trends in the size and composition of the working age population provide important insights into the changes in the potential labor supply of the country (Center for labor market studies at Northeastern University 2008).

The growth in the working age population can be viewed as the joint effect of the change in the size and age distribution of population. There were a total of 10,003.6 thousand of working age population (males aged 16-63 and females aged 16-58) in Kazakhstan in 2007. This was up from 8,917.7 thousand of working age population in 1999 and represents an increase of 1,085.9 thousand of working age population or 10% over the nine year period (see Figure 2). The country had a higher rate of growth of its working age population than the rate of growth of its total population (10% compared to 3%, respectively). Underlying this difference in growth rates, this growth was in increase of Kazakhstani population under 16 years old and 65 years old and over. So hypothesis stating that the size of working age population of Kazakhstan increased during the considered period from 1999 to 2007 is proved.

The number of working age population (males aged from 16 to 63 years old and females aged from 16 to 58 years old) aged from 35 to 44 years old declined by 255.6 thousand of people (or 11.1%) during the considered period in 1999–2007, while those who aged 55-64 – by 39.1 thousands of people (or 5.5%). Kazakhstan had more inhabitants who aged 45-54 (45.9%) and 16-24 (13.3%). Mainly, the growth in the number of working age population was for those people who aged from 16 to 34 years old because it comprised of individuals who were born between 1980s and 1990s and were members of the baby-boom generation.

Figure 2 – Working age population development in 1999–2007 (in thousand)



NOTE: Here included economically active and inactive males aged 16-63 and females aged 16-58

SOURCE: Author's calculations based on the data from the Agency of Statistics of the Republic of Kazakhstan

The growth in the number of working population who aged from 45 to 54 years old represents the aging of baby-boom generation which means that in the 1999, the members of baby-boom generations (born between 1946 and 1964) were at age 35-53 years old, and, by 2007, they were at age 43-61 years old as a result of large increase in the 45-54 age group population (see Table 1).

Table 1 – Change in the working population of Kazakhstan by age in 1999 and 2007 (in thousand)

Age	1999	2007	Absolute change	Relative change, %
16-24	2,326.9	2,637.4	310.5	13.3
25-34	2,265.2	2,633.5	368.3	16.3
35-44	2,307.1	2,051.5	–255.6	–11.1
45-54	1,377.0	2,009.2	632.2	45.9
55-64	711.1	672.0	–39.1	–5.5

NOTE: Here included economically active and inactive males aged 16-63 and females aged 16-58

SOURCE: Author's calculations based on the data from the Agency of Statistics of the Republic of Kazakhstan

Now we would like to break population figures down to the regional dimensions of Kazakhstan and study the employment status of population of Kazakhstan in 2007. It is clear that in Southern Kazakhstan region the number of total population was the highest among other regions of Kazakhstan, and amounted to 2,282.5 thousand people, with the highest number of population aged 16-64 which is accounted 1,423.4 thousand people (or 62.4%), and the highest employed population aged 16-64 which is accounted 1,006.5 thousand people (or 70.7%). However, in Qostanay region the total number of population constituted 900.3 thousand people with 627.9 thousand people who are aged 16-64 (or 69.7%), and with the

highest working age employment rate – 82.6% (or 518.4 thousand people). The smallest number of total population was 390.5 thousand people in Manghystau region, with the smallest number of population aged from 16 to 64 years old 258.3 thousand people (or 66.1%) and the lowest employed population 177.8 thousand people (or 68.8%) but the lowest employment rate for working age population was observed in Astana city despite the fact that it was the highest proportion of working age population 437.5 thousand people (or 76.2%) with 66.5% of employment rate (see Table 2).

Table 2 – Population and employment by regions of Kazakhstan in 2007

Regions of Kazakhstan	**Total population (in thousand)**	**Population aged 16-64 (in thousand)**	**Working age population, in %**	**Employed population aged 16-64 (in thousand)**	**Percentage of employed out of working age population**
Republic of Kazakhstan	15,396.8	10,497.3	68.2	7,631.1	72.7
by regions:					
Aqmola	748.5	514.3	68.7	393.2	76.5
Aqtobe	695.4	476.3	68.5	358.5	75.3
Almaty	1,620.7	1,107.1	68.3	778.2	70.3
Atyrau	480.7	316.5	65.8	227.5	71.9
Western Kazakhstan	612.5	421.1	68.8	302.0	71.7
Zhambyl	1,009.2	662.9	65.7	506.2	76.4
Qaraghandy	1,339.4	935.6	69.9	694.8	74.3
Qostanay	900.3	627.9	69.7	518.4	82.6
Qyzylorda	625.1	400.4	64.1	282.6	70.6
Manghystau	390.5	258.3	66.1	177.8	68.8
Southern Kazakhstan	2,282.5	1,423.4	62.4	1,006.5	70.7
Pavlodar	744.9	530.8	71.3	390.0	73.5
Northern Kazakhstan	660.9	459.9	69.6	366.7	79.8
Eastern Kazakhstan	1,424.5	997.6	70.0	713.7	71.5
Astana city	574.5	437.5	76.2	290.8	66.5
Almaty city	1,287.2	927.6	72.1	624.3	67.3

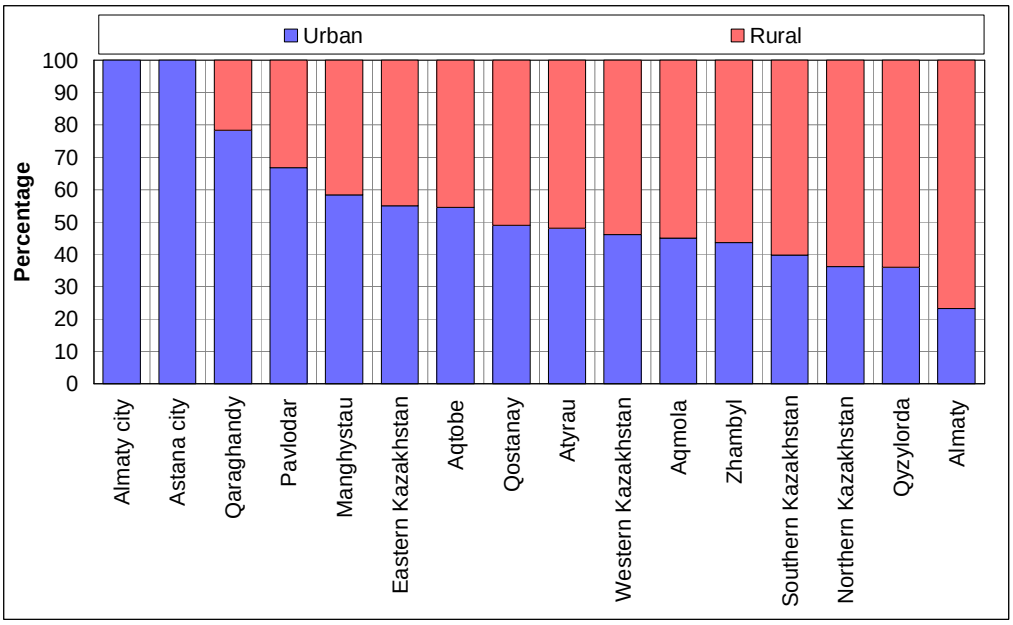
NOTE: Here included economically active and inactive males and females aged 16-64

SOURCE: The Agency of Statistics of the Republic of Kazakhstan

In 2007 the proportion of the urban working age population in two municipal districts Almaty and Astana cities was equal 100% due to their city status. As it is shown in the Figure 3 the highest proportion of rural working age population was observed in Almaty, Qyzylorda, Northern Kazakhstan, Southern Kazakhstan and Zhambyl regions. Kazakhstan had the economy which was based on the nomadism till the Soviet

collectivization, and that is why, we notice that nowadays in many regions of Kazakhstan the rural working age population is prevails over urban. Excluding Astana and Almaty cities, the highest proportion of urban working age population noted in Qaraghandy, Pavlodar and Manghystau regions, and this could be explained by industrial orientation of these regions. It is also important to add that if Astana and Almaty cities did not receive their city status of republican submissions and were not separated as cities; the most likely situation could be that in Aqmola and Almaty regions where urban population would be more dominated than rural population.

Figure 3 – Distribution of urban and rural working age population by regions of Kazakhstan in 2007 (in %)



NOTE: Here included economically active and inactive males and females aged 16-64

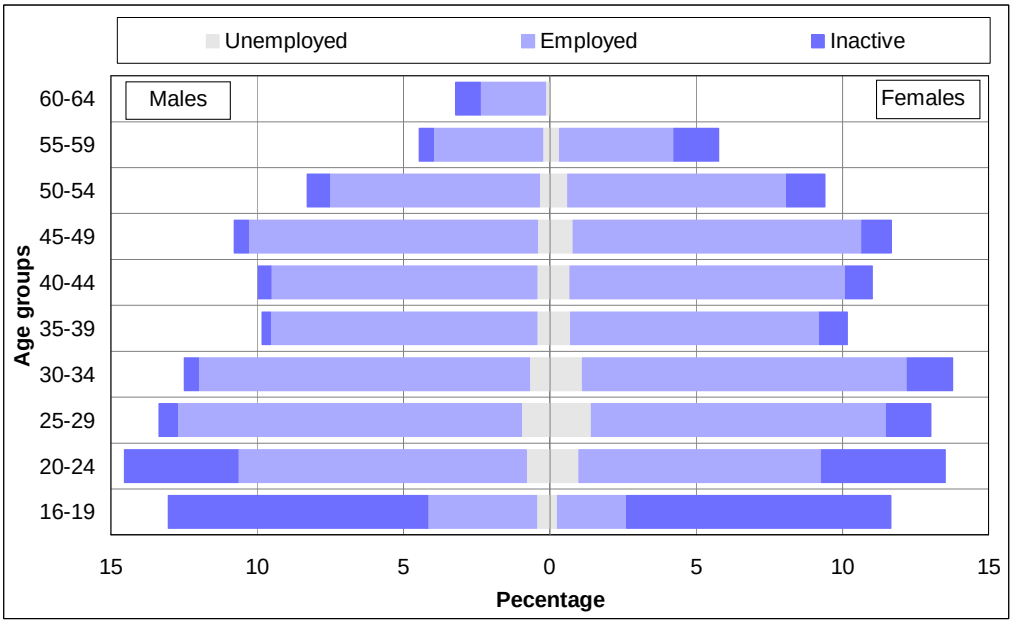
SOURCE: Author's calculations based on the data from the Agency of Statistics of the Republic of Kazakhstan

7.2 Age and sex structure of working population

According to the ages, people have different needs and place different demands on services at various stages in their lives. There is a very strong relationship between people's need and activities on the one hand, and age on the other. To ensure the effectiveness and maximum impact on public policy and development activities in general, it is essential that policy analysts, planners and policy-makers have a good understanding of their population's age structure (Siosikefu and Haberkorn 2008).

In 2007 the working age population (males aged 16-63 and females aged 16-58) of Kazakhstan consisted of 4,911.1 thousands of males and 5,003.5 thousands of females, reflecting a sex ratio of 98%; that is, 98 males for every 100 females. Figure 4 shows the proportion of age and sex structure of working population at the time of the 2007 census.

Figure 4 – Age and sex structure of working population by categories of employed, unemployed and inactive people in Kazakhstan in 2007



NOTE: Here included economically active and inactive males aged 16-63 and females aged 16-58

SOURCE: Author's calculations based on the data from the Agency of Statistics of the Republic of Kazakhstan

A population pyramid shows the proportion of males and females in five age groups by categories of employed, unemployed and inactive, beginning with the youngest age groups in the bottom, and increasing with age towards the top of the pyramid. The proportion of males is higher for 16-29 age groups than females at the same age groups; conversely, the proportion of females is higher from 30 to 59 age groups than males due to the fact that females live longer than males, and also males generally drive, smoke and drink more than females (Rosenberg 2007). The highest proportion of inactive population is observed among the youth (aged 16-19) which can be explained by their attendance of educational institutions. The highest proportion of employed persons noted among adults who aged from 25 to 64 years old due to the fact that they have some experiences, trainings and skills which are necessary in the labor market in order to be employed. The lowest proportions of employed persons observed among the youth and older people because the youth enter the labor force at first without any experiences, and conversely, older people leave the labor force at last due to retirement.

One frequently used index summarizing age distribution is known as the dependency ratio. Strictly, this is the ratio of economically active to economically inactive persons in a population, but often, because of lack of data or difficulties in defining economic activity in Kazakhstan, a ratio of age groups is used instead. So the age dependency ratio is used as indicators of the economic burden the productive portion of a population must carry–even though some persons defined as "dependent" are producers and some persons in the "productive" ages are economically dependent. For instance, countries with very high birth rates usually have the highest age dependency ratios because of the large proportion of children in the

population (Newell 2004). Higher dependency ratio indicates that those who are working have a greater responsibility than other regions to provide for the dependents.

The dependency ratio is so called because it indicates that those who are under or above working age are dependent on those who work. Children under age 15 generally rely on their parents or guardians to support them financially, while the older members of the population count on government assistance and pension to provide for them financially throughout retirement (Burkot 2009).

For the calculation of dependency ratio in Kazakhstan in selected years we took the number of dependents (population under age 15 and population above age 65), and then divided this sum to the population aged 16-64. The results of these calculations are shown in the Table 3.

Table 3 – Dependency ratio by sex in urban and rural areas of Kazakhstan in 1999, 2003 and 2007

Year	Area	Sex	Dependency ratio
1999	Total	Total	54.0
		Males	53.4
		Females	54.6
	Urban	Total	48.1
		Males	48.2
		Females	48.0
	Rural	Total	62.3
		Males	60.0
		Females	64.6
2003	Total	Total	48.7
		Males	47.9
		Females	49.6
	Urban	Total	44.0
		Males	43.7
		Females	44.2
	Rural	Total	55.5
		Males	53.3
		Females	57.7
2007	Total	Total	46.5
		Males	45.3
		Females	47.6
	Urban	Total	42.6
		Males	42.1
		Females	43.1
	Rural	Total	51.1
		Males	48.8
		Females	53.5

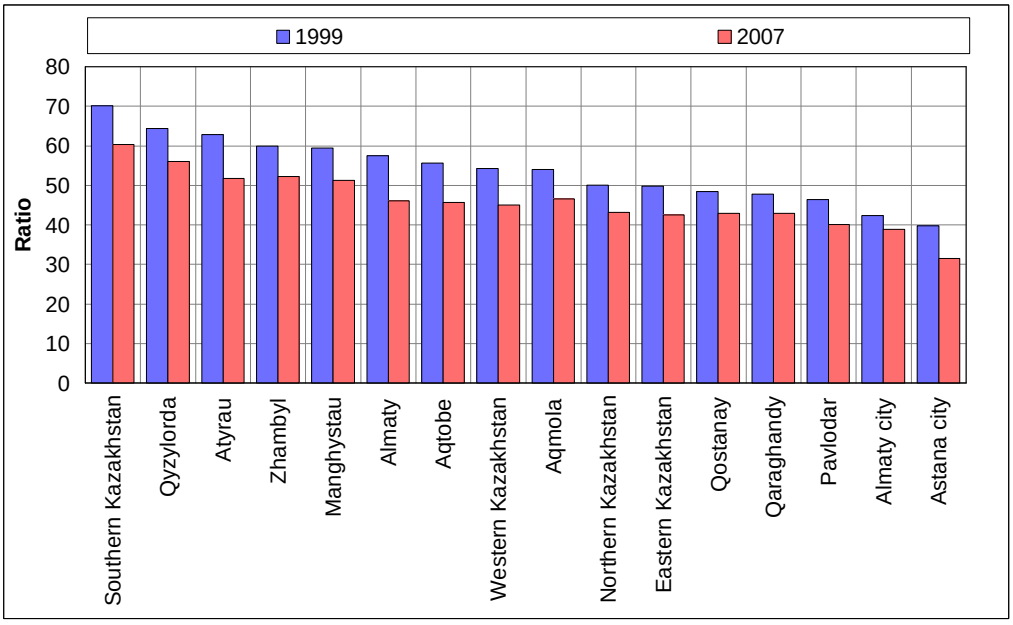
NOTE: Here included economically active and inactive males and females aged 16-64

SOURCE: Author's calculations based on the data from the Agency of Statistics of the Republic of Kazakhstan

In 2007 the dependency ratio had a tendency of decreasing from 46 in comparison with 1999 to 54 which can be explained by increasing proportion of working age population and decreasing young population. The dependency ratio in Kazakhstan was higher among females than males, and was higher in rural areas than in urban areas of Kazakhstan in selected years. For example, in 1999 in rural areas of Kazakhstan there were 64 females in dependent age for every 100 females in working age versus 60 males in dependent age for every 100 males in working age. In rural areas of Kazakhstan there were 51 persons in dependent age for every 100 persons in working age whereas in urban areas – 42 persons in dependent age for every 100 persons in working age in 2007.

If we look through the dependency ratio by regions of Kazakhstan we can see that dependency ratio decreased in all regions in 2007 in comparison with 1999. The lowest dependency ratio was observed in Astana and Almaty cities, and the highest dependency ratio observed in Southern Kazakhstan and Qyzylorda regions. In author's opinion, this could be because of that Southern Kazakhstan and Qyzylorda regions have the highest proportion of children in comparison with other regions, for example, the total fertility rate for these regions was estimated as 3.6‰ and 3.3‰ in 2007, respectively. In case of Astana and Almaty cities, we can say that these are financial centers with a high concentration of financial and intellectual capital, and leading in construction and service sectors such as trade, hotels, restaurants, transport, communication, real estate, education and health services (Tussupbayeva 2007). That is why; the proportion of working age population is more concentrated in these cities (see Figure 5).

Figure 5 – Dependency ratio by regions of Kazakhstan in 1999 and 2007



NOTE: Here included economically active and inactive males and females aged 16-64

SOURCE: Author's calculations based on the data from the Agency of Statistics of the Republic of Kazakhstan

So the growth of population as well as the growth of working age population impacts many aspects of the economy and delivery of public goods and services, including educational

services, police and medical care as well as labor force. The growth in the number of available workers increases the aggregate labor pool and may be a business opportunity to expand production capacity. For example, a large labor force, without available jobs, may result in lower wages/salaries as more workers compete for job (Great Valley Center 2005). That is why; the next section will focus on the labor force (employed and unemployed) and labor force participations of working age population of Kazakhstan.

Chapter 8

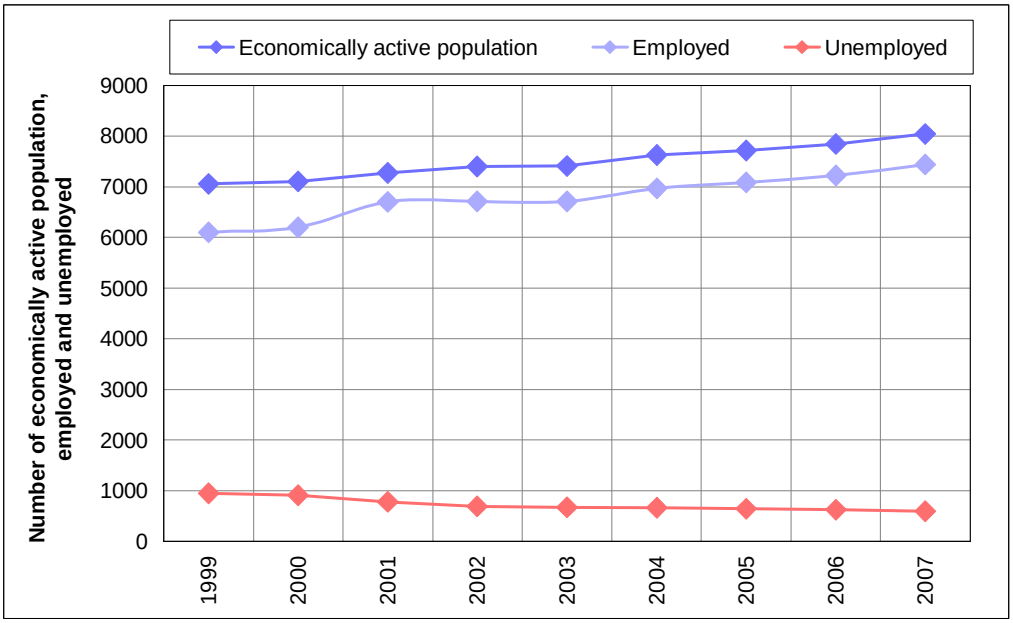
Economically active population (or labor force)

Economically active population of working age is divided into two categories employed and unemployed that is why, this sections will be dedicated to these categories of working age population of Kazakhstan. We will analyze employed and unemployed people by sex, age, educational level, place of residence, and regions of Kazakhstan, and also the economic activity, employment and unemployment rates will be calculated.

From the methodological section of present master's thesis we know that economically active population is also called labor force, and calculated by summing the number of employed and unemployed persons. The size of economically active population (or labor force) is determined by a country's population size (Aggestam and Hallberg 2004). There were 8,041.5 thousand of economically active people (males aged 16-63 and females aged 16-58) in Kazakhstan in 2007, and among them there were 7,446.4 thousand of employed and 595.1 thousand of unemployed persons in 2007. From 1999 to 2007 the total number of economically active population increased to 986.1 thousand people (or 14.0%). In case of employed and unemployed persons, the total number of employed people increased to 1,340.9 thousand people (or 22.0%) whereas the total number of unemployed people decreased to 354.9 thousand people (or 37.4%) during the considered period from 1999 to 2007. The increasing of the number of employed and decreasing of the number of unemployed persons could be result of a number of factors such as favorable employment opportunities in the country, development of small and medium entrepreneurships, reduction of taxes and creation of new work places by government and non-government organizations (see Figure 6).

The economic activity rate (or labor force participation rate) is a measure of the extent to which the working age population is economically active. It provides an indication of the relative size of the supply of labor available for the production of goods and services. The economic activity rate is calculated by expressing the number of persons in the labor force as a percentage of the working age population (Statistics Department and Ministry of Finance of Tonga 2004).

Figure 6 – Number of economically active population, employed and unemployed in Kazakhstan from 1999 to 2007 (in thousand)

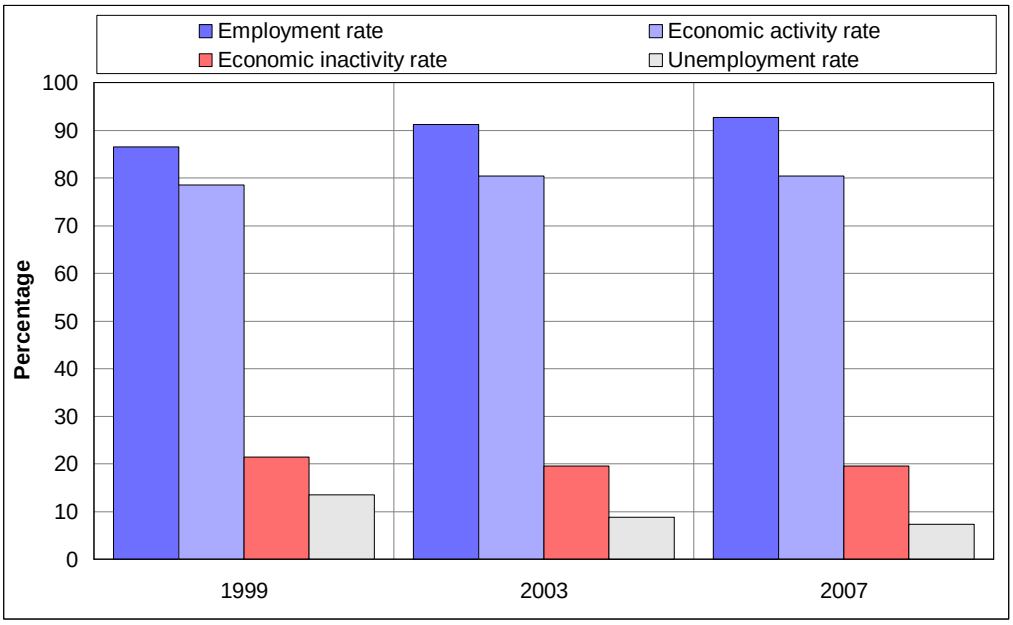


NOTE: Here included economically active (i.e., employed and unemployed) males aged 16-63 and females aged 16-58

SOURCE: The Agency of Statistics of the Republic of Kazakhstan

The economic activity rate for working age population increased from 78.5% in 1999 to 80.4% in 2007. The employment rate increased from 86.5% in 1999 to 92.7% in 2007 whereas the unemployment rate decreased from 13.5% in 1999 to 7.3% in 2007 (see Figure 7).

Figure 7 – Economic activity, employment, unemployment and economic inactivity rates in Kazakhstan in 1999, 2003 and 2007 (in %)



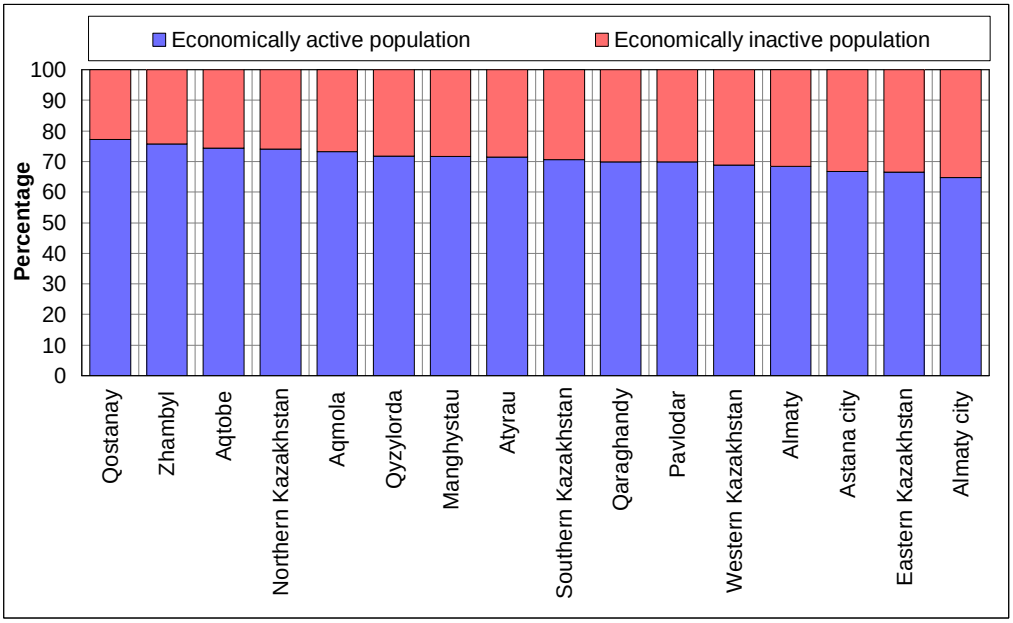
NOTE: Here included economically active and inactive males aged 16-63 and females aged 16-58

SOURCE: The Agency of Statistics of the Republic of Kazakhstan

The increasing employment rate can be viewed from two perspectives. On the one hand, a high labor force participation rate suggests a strong and growing economy of Kazakhstan where jobs are available for those who want them. On the other hand, a high employment rate may not always be desirable because it could indicate that more people are working in multiple jobs and that an increasing share of households need two incomes to make ends meet (Department of Administration/Office of Geographic and Demographic Analysis 2009).

In case of regional dimensions of Kazakhstan, the highest proportion of economically active population is observed in Qostanay region with the lowest proportion of economically inactive population in 2007. The lowest proportion of economically active population and the highest proportion of economically inactive population were noted in Almaty city at the same period. In author's opinion, in Almaty city there are a lot of young people (aged 16-24) who are economically inactive due to attendance of educational institutions, on the one hand, and as we mentioned before, it is a business city where businessmen's wives usually prefer being engaged into household duties to spending their time in work place, on the other hand (see Figure 8).

Figure 8 – Proportion of economically active and inactive population by regions of Kazakhstan in 2007 (in %)



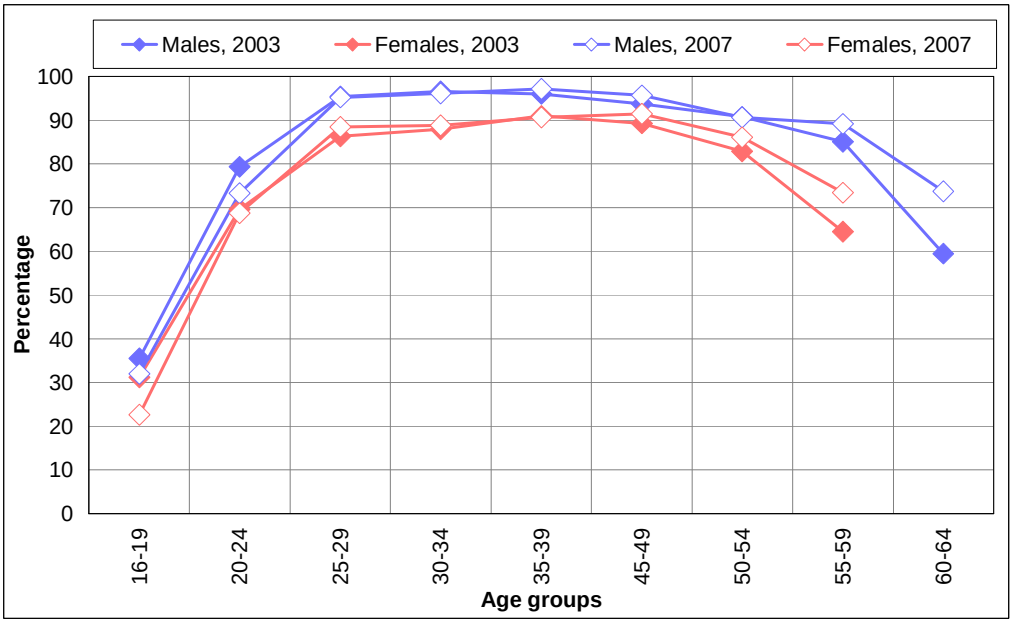
NOTE: Here included economically active and inactive males aged 16-63 and females aged 16-58

SOURCE: The Agency of Statistics of the Republic of Kazakhstan

A particular useful form of analysis labor force is to examine how the economic activity rate varies according to the person's age and sex (age-specific activity rate). Initially the economic activity rate for males and females is low for young people (aged 16-19) due to their attendance of educational processes. From about of age 20 the economic activity rates rise rapidly, especially for males, as people seek or find a job. During the main working age males' activity rates are

consistently over 90%, whereas females' activity rates are around 80%. Towards the end of people's working lives (aged 60-64 for males and 55-59 for females), the economic activity rates start to drop. As we see at all ages females are likely than males to participate in the labor force. Apart from any educational, institutional or cultural barriers females may face, one reason for female's lower labor force participation rate is that they must often deal with competing demands of household duties, including childcare (Statistics Department and Ministry of Finance of Tonga 2004) (see Figure 9).

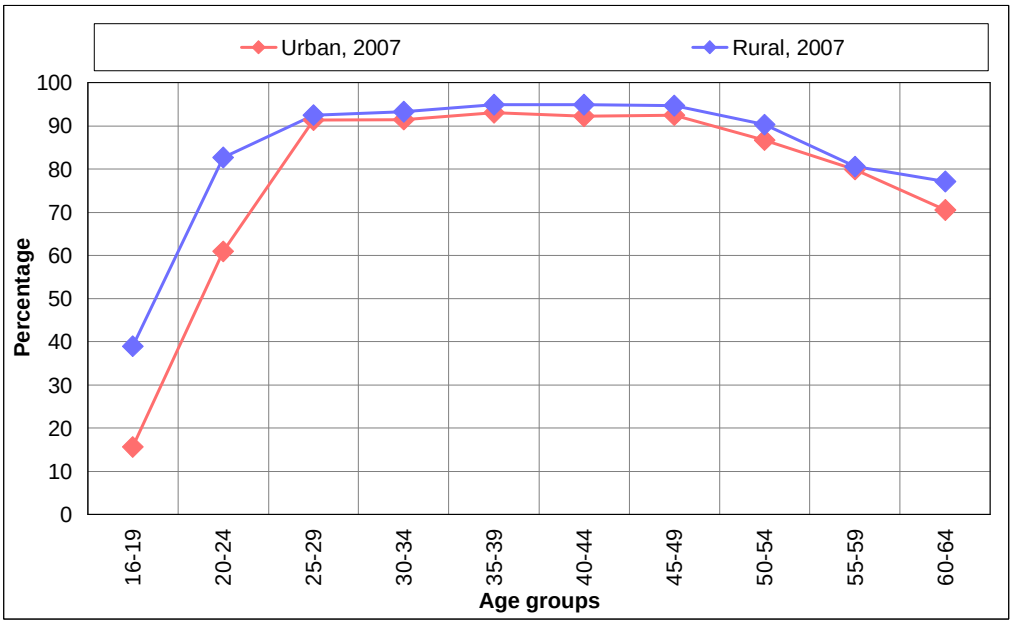
Figure 9 – Age-specific economic activity rates for males and females in Kazakhstan in 2003 and 2007 (in %)



NOTE: Here included economically active (i.e., employed and unemployed) males aged 16-63 and females aged 16-58
SOURCE: The Agency of Statistics of the Republic of Kazakhstan

In 2007 the economic activity rate in rural areas was 83.4% whereas in urban areas it constituted 77.9%. The age-specific economic activity rate in rural areas was higher than in urban areas of Kazakhstan, especially for the youth (aged 16-29). This situation could be explained by the fact that young people in rural areas could be employed in seasonal work or be employed in agricultural farm whereas young people in urban areas do not have this kind of opportunities. The situation with economic activity rates in urban and rural areas of Kazakhstan is similar to the situation which was described above. In 2007 the highest economic activity rate was observed for 25-49 age groups in urban and rural areas, while the lowest economic activity rate was noted for 16-24 and 60-64 age groups. On the other hand, the economic activity rate was higher in rural areas of Kazakhstan than in urban ones due to the fact that many young people leave their native villages in rural areas and move to big cities in order to find better jobs and better life but they often face with the problems of being unemployed in urban areas (see Figure 10).

Figure 10 – Age-specific economic activity rates in urban and rural areas of Kazakhstan in 2007 (in %)



NOTE: Here included economically active (i.e., employed and unemployed) males aged 16-63 and females aged 16-58

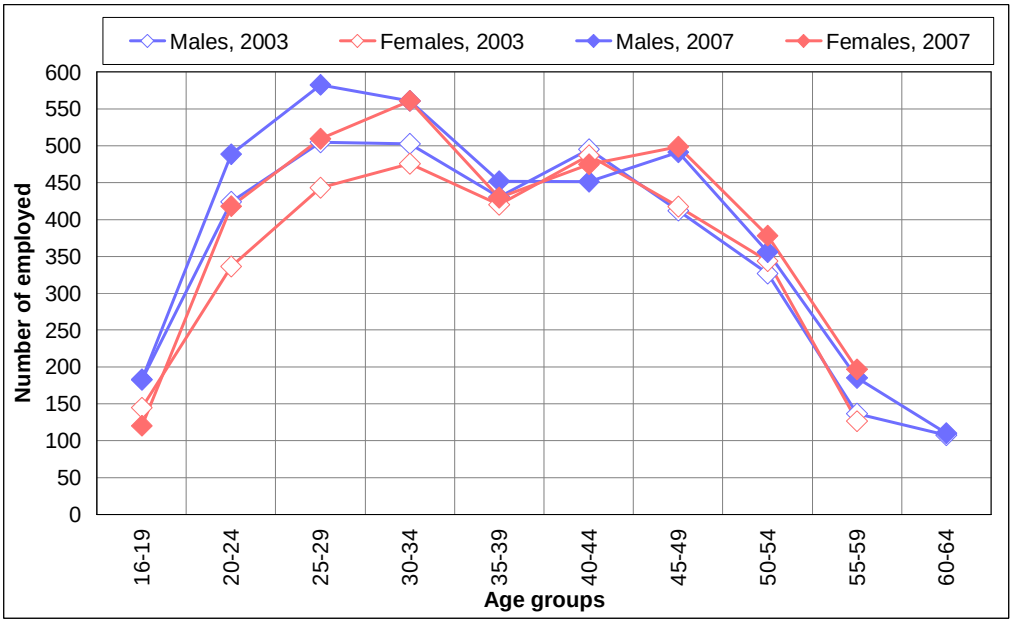
SOURCE: The Agency of Statistics of the Republic of Kazakhstan

8.1 Employed

8.1.1 Employed by sex and age

In the Figure 11 we represent the information about the employed males and females in working age in 2003 and 2007.

Figure 11 – Employed males and females by age in Kazakhstan in 2003 and 2007 (in thousand)



NOTE: Here included employed males aged 16-63 and females aged 16-58

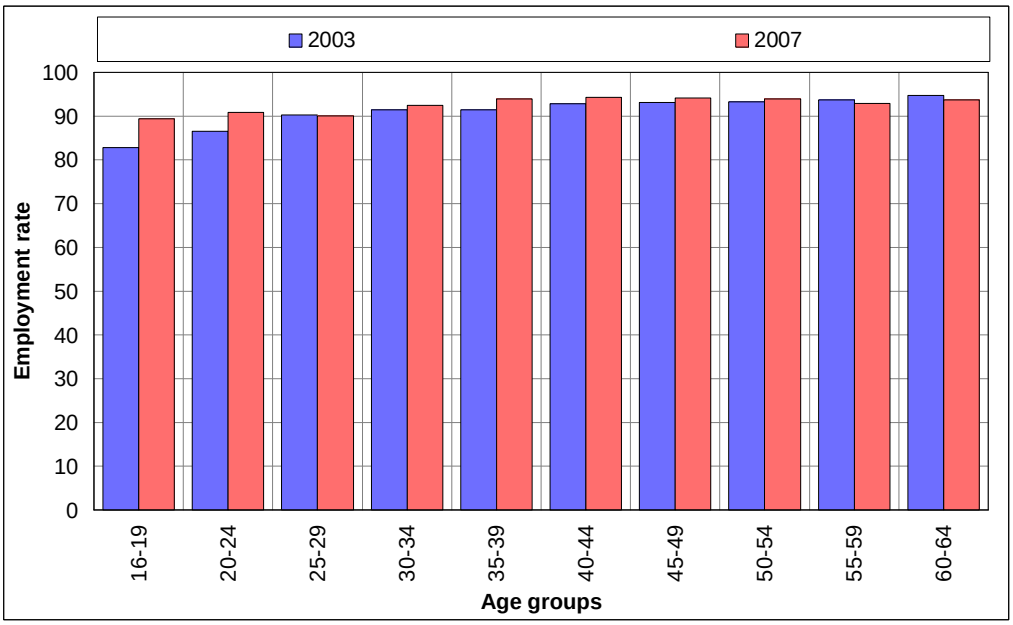
SOURCE: The Agency of Statistics of the Republic of Kazakhstan

According to the statistical data of Kazakhstan, the total number of the employed persons in working age constituted 7,446.3 thousand people where 3,860.3 thousand of males (or 51.8%) and 3,586.1 thousand of females (or 48.2%) in 2007. The highest number of employed males and females in working age was observed for 25-34 and 40-49 age groups and the lowest – for the youth (aged 16-24) and older people (aged 60-64 for males and 55-59 for females) in selected years. The interesting trend was noted for employed males and females who aged from 35 to 39 years. In author's opinion, the number of employed males and females for 35-39 age group should be higher than for 30-34 and 40-44 age groups because in the structure of population there was not any gaps but in our case it is opposite situation where the number of employed for 35-39 age group was lower than for age groups which were mentioned above. We assume that it could be a result of an error in data processing.

8.1.2 Employment rate

In order to calculate the employment rate we have to take the total number of employed persons, and then divide it to the total number of active population (or number of persons who are in the labor force). As a result we see that the highest employment rate was noted for 40-49 age groups while the lowest employment rate was observed for the youth (aged 16-24) in selected years. In 2007 the employment rate increased significantly for 16-19 and 20-24 age groups but it decreased for 25-29, 55-59 and 60-64 age groups in comparison with 2003 (see Figure 12).

Figure 12 – Age-specific employment rates in Kazakhstan in 2003 and 2007 (in thousand)



NOTE: Here included employed males aged 16-63 and females aged 16-58

SOURCE: The Agency of Statistics of the Republic of Kazakhstan

The rise in the employment rate between 2003 and 2007 affected all age groups for males and females. The youth employment rates have remained relatively low in comparison with other age groups during the period of employment growth, possibly due to a growth in their participation in tertiary education and training.

There is an exception for the older people who aged their 60-64 years for males and 55-59 years for females, for example, in 2003 the employment rate for males for 60-64 age groups was 94.7% and for females for 55-59 age groups – 92.5% but in 2007 these rates decreased to 93.7% and 91.1%, respectively. The employment rate for females was significantly lower than that for males. This is mainly because women spend more time on childcare and other unpaid household work, and are more likely than men to undertake some form of study or training (Ministry of Social Development of New Zealand 2008) (see Table 4).

Table 4 – Employment rates by sex and age in Kazakhstan in 2001 and 2007 (in %)

Age groups	2003		2007	
	Males	**Female**	**Males**	**Female**
16-19	84.1	81.2	89.0	90.1
20-24	88.4	84.3	92.4	89.2
25-29	91.9	88.5	92.4	87.7
30-34	93.7	89.4	94.3	90.8
35-39	93.7	89.4	95.5	92.3
40-44	94.3	91.2	95.5	93.1
45-49	95.1	91.3	96.0	92.5
50-54	95.0	91.7	95.4	92.6
55-59	94.8	92.5	94.0	91.9
60-64	94.7	–	93.7	–
TOTAL	92.6	89.2	94.0	91.1

NOTE: Here included employed males aged 16-63 and females aged 16-58

SOURCE: The Agency of Statistics of the Republic of Kazakhstan

8.1.3 Employed by educational level

The educational attainment influences economic well-being of the country. More education tends to be reflected in greater socio-economic success of individuals and the country (Newburger and Curry 1999). The educational system of Kazakhstan is divided into primary school, lower secondary school, higher secondary school, and tertiary institutions. Primary school education starts at age 6 and runs from 1 to 5 years. Primary school is provided for free to all citizens and residents of Kazakhstan. The lower secondary school continues from 5 to 9 grades. This roughly corresponds to what is called in the USA, junior higher school, or middle school. Once leaving lower secondary school, there are three tracks available as a higher secondary school:

– *initial training schools* are designed to train students in a skilled profession. This program is usually two or three years, (typically those who aged 16-18), but for some professional

training four year programs are required. Students who graduate it can go on to colleges for advanced vocational training or attend university;

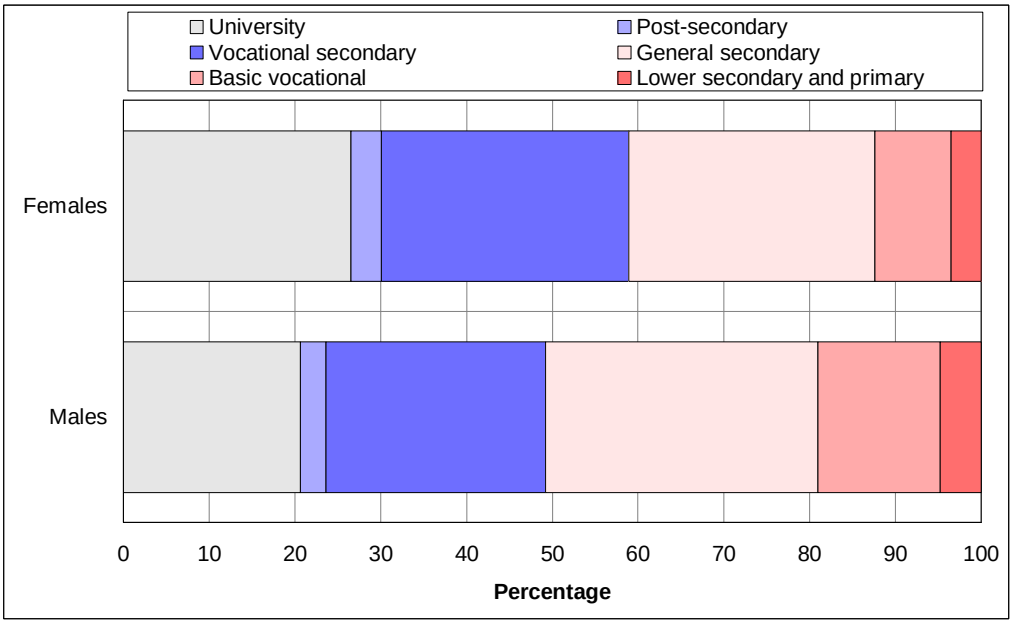
– *lyceums* provide basic vocational education to prepare students for skilled professions but also include general academic education and the course of study three years;

– *colleges* give a program that provides both academic general education and advanced vocational education. Programs last for three or four years (grades 10-12, 13). Graduates may go on to university or may begin working.

There are four levels of tertiary education in Kazakhstan: Bachelors degree – typically a four–year degree, specialist degree – typically a five–year degree and more, Masters degree – typically a two–year degree and Doctoral degree – typically a five–year program (Wikipedia 2009b). Graduation from university or reaching a diploma of any vocational school is the key way of acquiring a profession (Kowalska 1995).

The national statistical office of Kazakhstan provides with data about the educational level of economically active (i.e., employed and unemployed) and inactive population by the following types: primary and lower secondary, basic vocational, general vocational, vocational secondary, post-secondary and university. The educational level of employed males and females is shown in the Figure 13.

Figure 13 – Employed males and females by educational level in Kazakhstan in 2007 (in %)



NOTE: Here included employed males aged 16-63 and females aged 16-58

SOURCE: The Agency of Statistics of the Republic of Kazakhstan

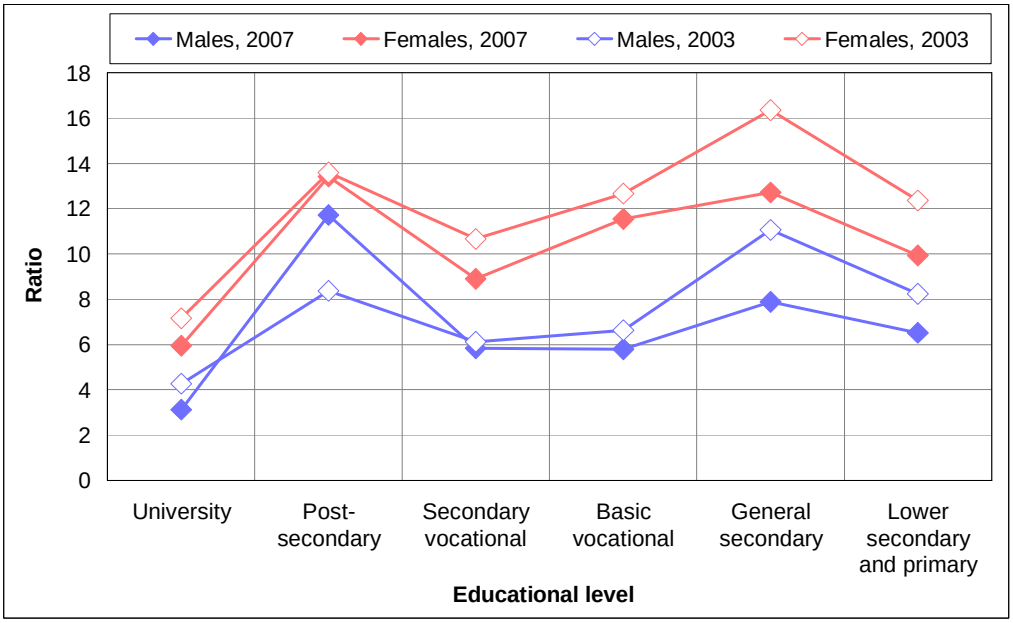
The highest proportion of educational level of employed males and females was observed among those who had general secondary, vocational secondary and university degree in 2007. The university, post-secondary and vocational secondary education were the most prevalent among employed females than males whereas general secondary, basic vocational and lower secondary and primary education were prevalent the most among employed males than

females. While females prefer to have university education, males prefer to help their parents, be with job and get salary/wage.

Among the employed persons who had university education 95.5% of them were employed in the different spheres of the economy of Kazakhstan whereas employed persons who had post-secondary education only 88.8% of them were employed. This means the higher level of education is more likely to be employed. In 2007 among the employed persons there were 20.6% of males (aged 16-63) and 26.5% of females (aged 16-58) who had university degree and were employed in different spheres of economy. The other educational levels of employed males and females were contributed by following: the post-secondary education had only 3.0% of males and 3.6% of females, vocational secondary – 25.6% and 28.8%; basis vocational – 14.3% and 8.9%, general secondary – 31.8% and 28.7%; lower secondary and primary – 4.8% and 3.5%, respectively.

The unemployed-to-employed ratio by sex and educational level was higher in 2003 in comparison with 2007. For example, in 2003 there were 7 unemployed females who had university degree per 100 employed females with the same level of education but by 2007 this ratio decreased to 6 unemployed females with university degree per 100 employed females. The ratio of unemployed-to-employed was higher among the females than males in all levels of education in selected years due to lack of any work and engagement of housekeeping. There were 8 unemployed males who had general secondary education per 100 employed males with the same educational level in 2003 versus 13 unemployed females per 100 employed females (see Figure 14).

Figure 14 – Unemployed-to-employed ratio by sex and educational level in Kazakhstan in 2003 and 2007 (per 100 persons)



NOTE: Here included employed males aged 16-63 and females aged 16-58

SOURCE: The Agency of Statistics of the Republic of Kazakhstan

8.1.4 Employed by status in employment

The total number of working age population (males aged 16-63 and females aged 16-58) who were employed in different spheres of the economy increased from 6,715.6 thousand people (of these, 52.4% of males and 47.6% of females) in 2003 to 7,446.3 thousand of people (51.8% and 48.2%, respectively) in 2007. The employees numbered in 4,187.6 thousand of people (or 62.4%) in 2003 and 4,921.8 thousand of people (or 66.1%) in 2007, self-employed persons numbered in 2,527.9 thousand of people (or 37.6%) in 2003 and 2524.5 thousand of people (or 33.9%) in 2007. In general, we see that from 2003 to 2007 the number of employees increased to 3.7% whereas the number of self-employed decreased to 3.7%. The highest proportion of employees was observed in private sectors of economy – 40.8% in 2003 and 47.0% in 2007, and in government structure – 40.6% and 33.8%, respectively. The lowest proportion of employees was observed for farms 6.4% in 2003 and 7.5% in 2007. We see that in 2007 the number of private employees, individuals and farmers increased in comparison with 2003 whereas the number of government employees decreased at the same periods of time.

Regarding the self-employed, the highest proportion, 91.9% of self-employed were own-account workers in 2003 and 91.0% in 2007, and the lowest proportion, 2.9% of self-employed were members of producers' cooperatives in 2003 and 1.2% in 2007, employers – 2.5% and 4.8%, respectively. We also see that in 2007 the number of employers increased in comparison with 2003 whereas the number of own-account workers, members of producers' cooperatives and unpaid family workers decreased. If we breakdown employed males and females by status in employment we see that among government employees and unpaid family workers females are prevalent the most than males (see Table 5).

Table 5 – Employed by sex and status in employment in Kazakhstan in 2003 and 2007 (in thousand)

Status	2003			2007		
	Total	**Males**	**Females**	**Total**	**Males**	**Females**
Employed	6,715.6	3,522.2	3,193.4	7,446.3	3,860.3	3,586.0
Employees	4,187.7	2,272.5	1,915.2	4,921.8	2,577.4	2,344.4
including those who are employed in:						
Government employees	1,700.1	730.1	970.1	1,663.0	659.6	1,003.4
Private employees	1,708.5	1,095.5	613.0	2,315.7	1,391.8	923.9
Individuals	512.2	253.7	258.4	573.2	281.6	291.6
Farms	267.0	193.3	73.7	369.9	244.4	125.5
Self-employed	2,527.9	1,249.7	1,278.2	2,524.5	1,282.9	1,241.6
including those who are:						
Employers	63.2	47.4	15.9	121.1	80.6	40.5
Own – account workers	2,323.5	1,120.6	1,202.9	2,297.3	1,150.0	1,147.3
Members of producers' cooperatives	74.1	52.7	21.5	30.9	17.6	13.2
Unpaid family workers	67.0	29.0	38.0	75.2	34.6	40.6

NOTE: Here included employed males aged 16-63 and females aged 16-58

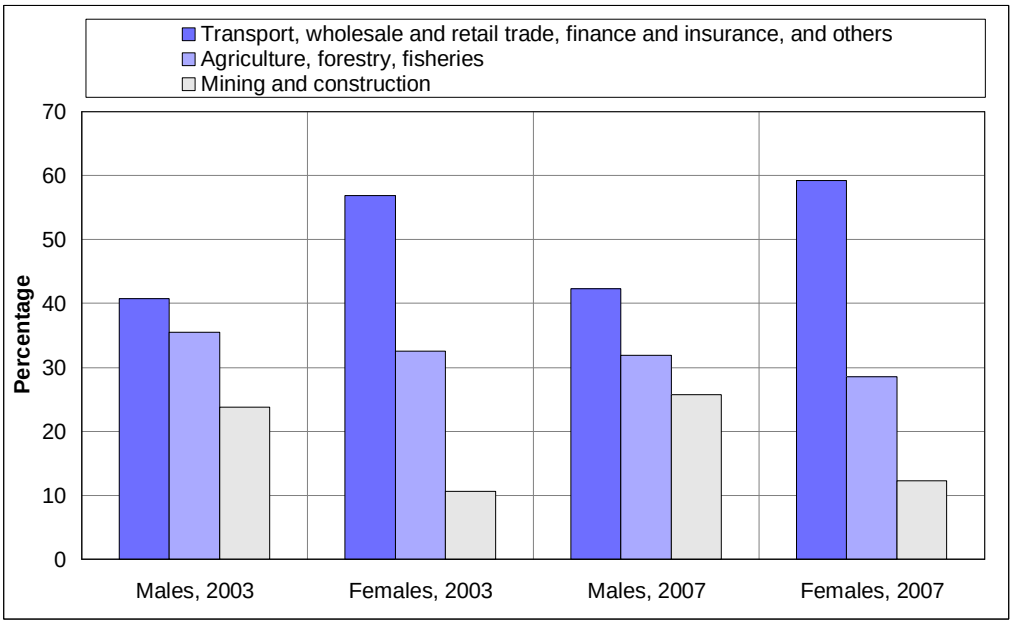
SOURCE: The Agency of Statistics of the Republic of Kazakhstan

8.1.5 Employed by economic activities

Regarding the distribution of the total of 7,446.3 thousand of employed people in working age (males aged 16-63 and females aged 16-58) among the three industrial groups of activity in 2007, we see that employed in the primary industry consisting of agriculture, forestry and fisheries numbered 2,255.3 thousand people (or 30.3%), those in the secondary industry consisting of mining and construction numbered 1,432.3 thousand people (or 19.2%), and those in the tertiary industry (or service sector) consisting of transport, wholesale and retail trade, and finance and insurance and others numbered 3,758.7 thousand people (or 50.5%) (Statistics Bureau of Japan 2005).

In the primary and secondary industries males prevail over females in selected years whereas in tertiary industries females prevail over males. This could be explained by the type of work (activity) which was performed by people, for example, the tertiary industry include these kinds of activities such as education, learning support, medical, health care and welfare where females take active participation than males whereas in mining and construction males take active participation than females (see Figure 15).

Figure 15 – Employed males and females by activity in Kazakhstan in 2003 and 2007 (in %)



NOTE: Here included employed males aged 16-63 and females aged 16-58

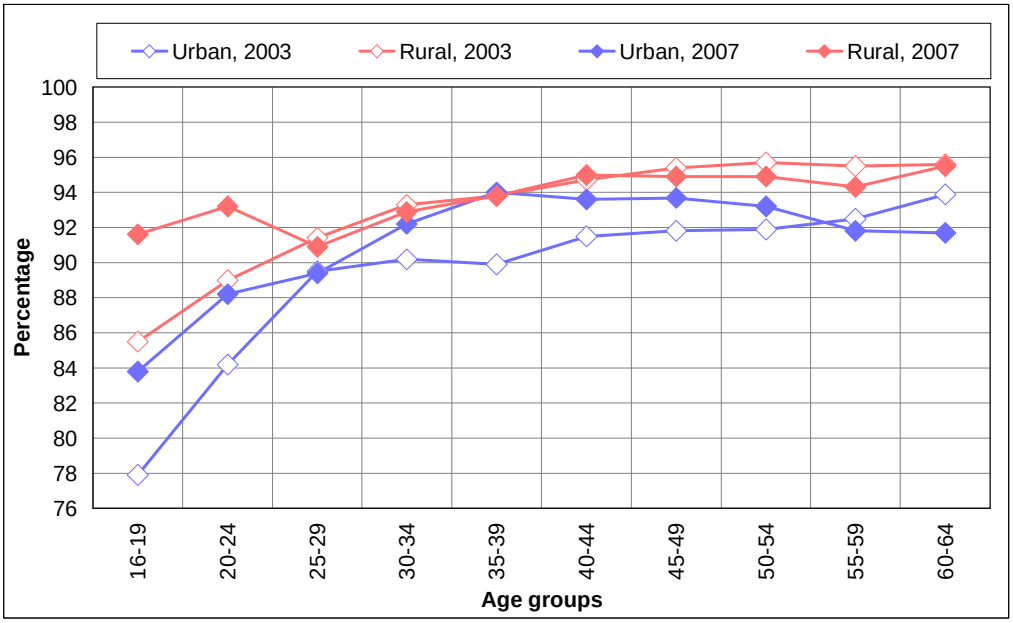
SOURCE: The Agency of Statistics of the Republic of Kazakhstan

8.1.6 Urban and rural employment rate

The employment rate was higher in urban and rural areas in 2007 in comparison with 2003, and constituted 89.7% in 2003 and 91.8% in 2007 in urban areas. In case of rural areas, it was 92.6% and 93.5%, respectively. The highest employment rate, according to the age groups, more than 92.0% was observed for 55-64 age groups in urban areas than in rural areas in selected years. The urban employment rate for 55-59 age groups was 92.5% while rural employment rate was 91.8%

for the same age groups. The lowest urban employment rate was observed for 16-19 age groups and numbered 77.9% in 2003 while rural employment rate was equal 85.5% (see Figure 16).

Figure 16 – Age-specific employment rates in rural and urban areas of Kazakhstan in 2003 and 2007 (in %)

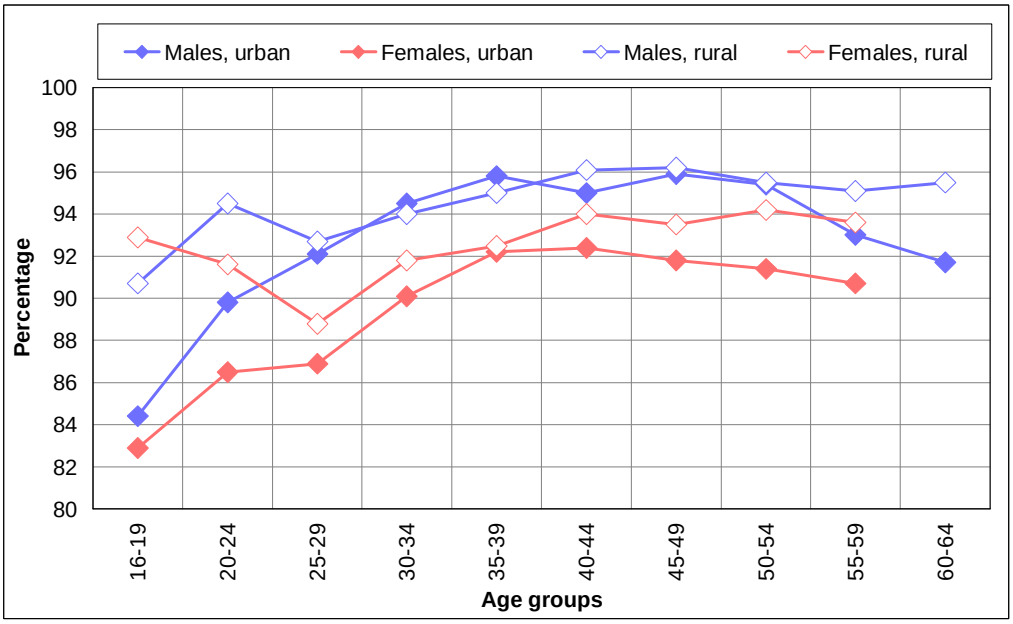


NOTE: Here included employed males aged 16-63 and females aged 16-58

SOURCE: The Agency of Statistics of the Republic of Kazakhstan

In the Figure 17 we represent the urban and rural age-specific employment rate by sex in Kazakhstan in 2007.

Figure 17 – Urban and rural age-specific employment rates by sex in Kazakhstan in 2007 (in %)



NOTE: Here included employed males aged 16-63 and females aged 16-58

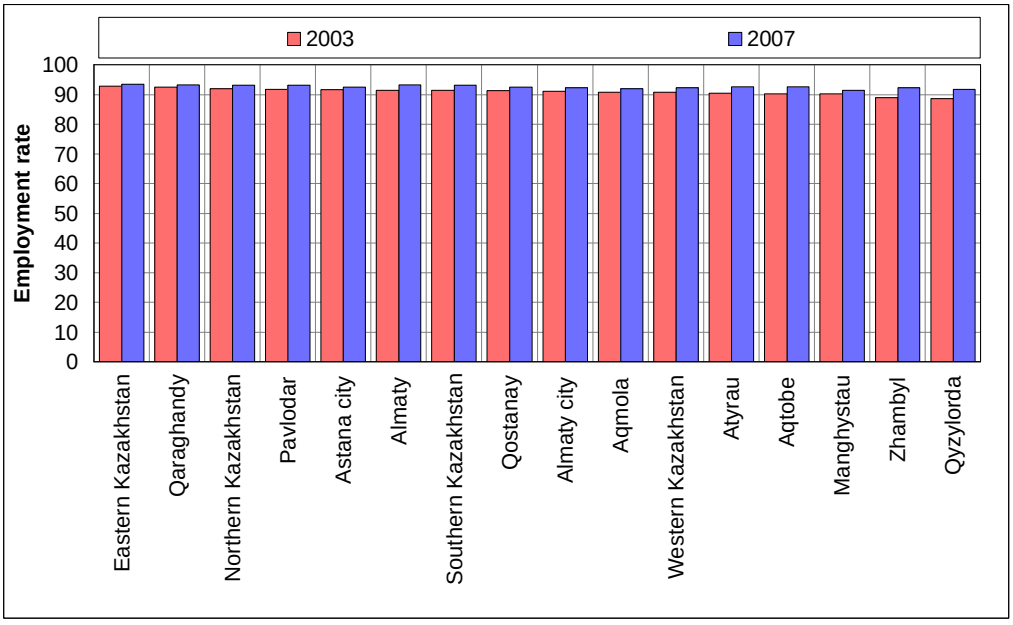
SOURCE: The Agency of Statistics of the Republic of Kazakhstan

The lowest urban and rural employment rate for males and females was observed for the youth (aged 16-24) in 2007. If the urban employment rate for males aged from 16 to 19 years old was 84.4% in 2007, the rural employment rate for males for the same ages was equal 90.7%. The youth in urban areas face the problem of being unemployed more often than the youth in rural areas. The highest urban and rural employment rate for males and females was observed for 35-49 age groups. It had been noted before that urban and rural employment rates were higher for males than females, for example, when males' employment rate in urban areas was equal 92.1% the females' employment rate constituted 86.9%.

8.1.7 Employment rate by regions

The highest employment rate was observed in Eastern Kazakhstan and Qaraghandy regions of Kazakhstan due to the location of many factories, enterprises and organizations where people could be employed. Moreover, Qaraghandy region is one of the most industrialized regions of Kazakhstan and takes a leading position in the production of coal, ferrous metal, copper and electricity. The lowest employment rate is traced in Qyzylorda and Zhambyl regions of Kazakhstan (see Figure 18).

Figure 18 – Employment rates by regions of Kazakhstan in 2003 and 2007 (in %)



NOTE: Here included employed males aged 16-63 and females aged 16-58

SOURCE: The Agency of Statistics of the Republic of Kazakhstan

8.2 Unemployed

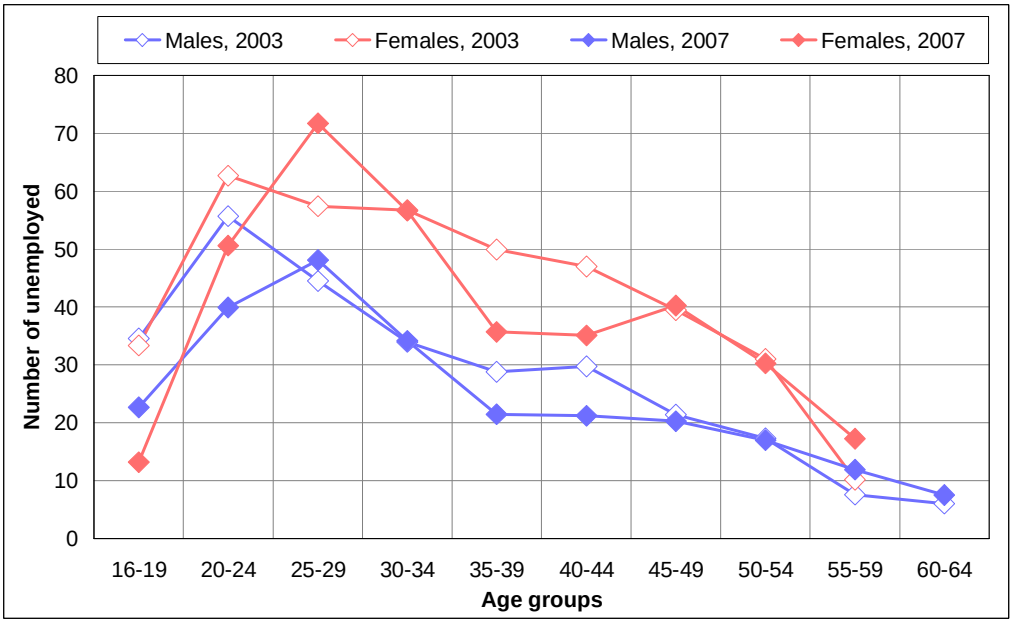
8.2.1 Unemployed by sex and age

The total number of unemployed in Kazakhstan decreased to 354.7 thousand people in the considered period from 1999 to 2007. This change primarily was associated with

government policies of helping population to obtain career information, develop skills, find good jobs and stay employed. In some cases, the Government of Kazakhstan fund employers and community organizations to hire persons and help them gain practical work experience and develop employment skills. In other cases, the local Departments of Labor and Social Protection of Population and agencies offer initiatives that give persons work experiences in specialized fields such as science and technology development or social work (Government of Canada 2009).

There were 41.0% of males and 59.0% of females who were unemployed from the total of unemployed in 2007. From the Figure 19 it is shown that the number of unemployed was particular higher among the youth (aged 16-29) in selected years, and especially among young females because the transition from school to work means entering the labor market relatively unskilled, inexperienced, unfamiliar with job search and unaware of the job opportunities open to them. Consequently, many of them face the possibility of unemployment during their initial years as members of the labor force (Kerr 2000).

Figure 19 – Unemployed males and females by age in Kazakhstan in 2003 and 2007 (in thousand)



NOTE: Here included unemployed males aged 16-63 and females aged 16-58

SOURCE: The Agency of Statistics of the Republic of Kazakhstan

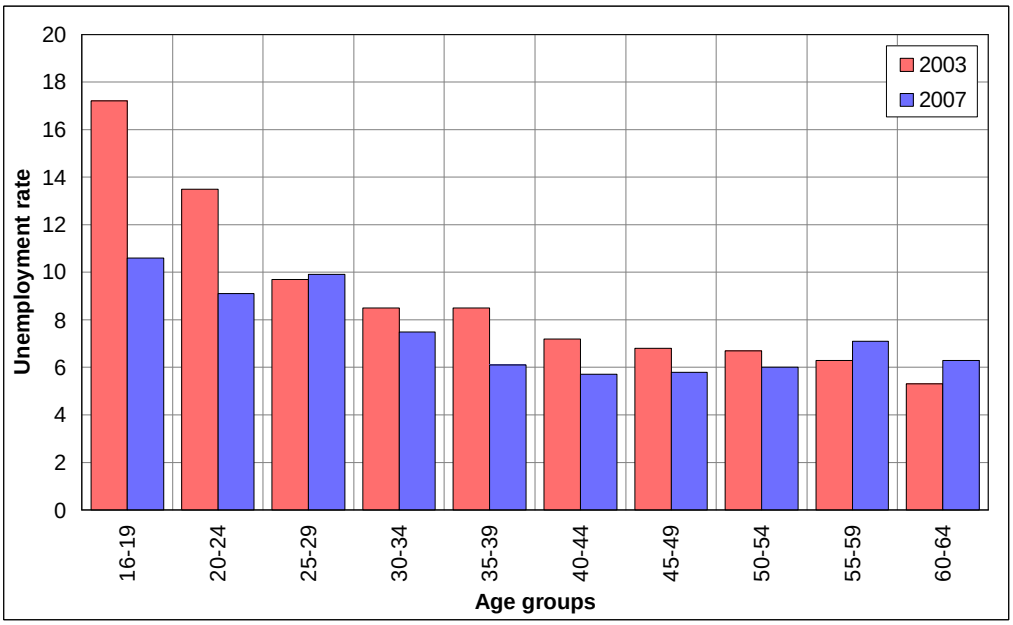
It is generally believed that much of this open unemployment is due to *structural* factors such as the nature of the educational system and its interface with the needs of the labor market (for example, the mismatch problem), technical change and the use of capital – intensive techniques of production, permanent shifts in the demand for goods and services especially in export markets, the skill mix of the labor force and available job opportunities and, to a lesser extent, *cyclical* factors such as the insufficiency of aggregate local and foreign demand for goods and services. *Institutional* factors such as the activities of labor unions and labor market regulations have also been raised as possible contributing factors to high levels

of unemployment. There has also been an increase in the number of 'discouraged workers' who are not employed and are not actively looking for work, even though they would like to work (Downes 1998). The lowest number of the unemployed was observed for males aged 60-64 and females aged 55-59 in selected years due to the fact that these ages are close to retirement.

8.2.2 Unemployment rate

The highest unemployment rate was observed for the youth (aged 16-24) in 2003. From the period of 2003 to 2007 the unemployment rate for 16-19 age groups decreased to 6.6% and 4.4% for 20-24 age groups. In 2007 the unemployment rate increased to 0.2% for 25-29, 0.8% for 55-59 and 1.0% for 60-64 age groups in comparison with 2003. The lowest unemployment rate was observed for 55-59 (6.3%) and 60-64 (5.3%) age groups in 2003 and for 35-39 (6.1%), 40-44 (5.7%) and 45-49 (5.8%) age groups in 2007 (see Figure 20).

Figure 20 – Age-specific unemployment rates in Kazakhstan in 2003 and 2007 (in %)



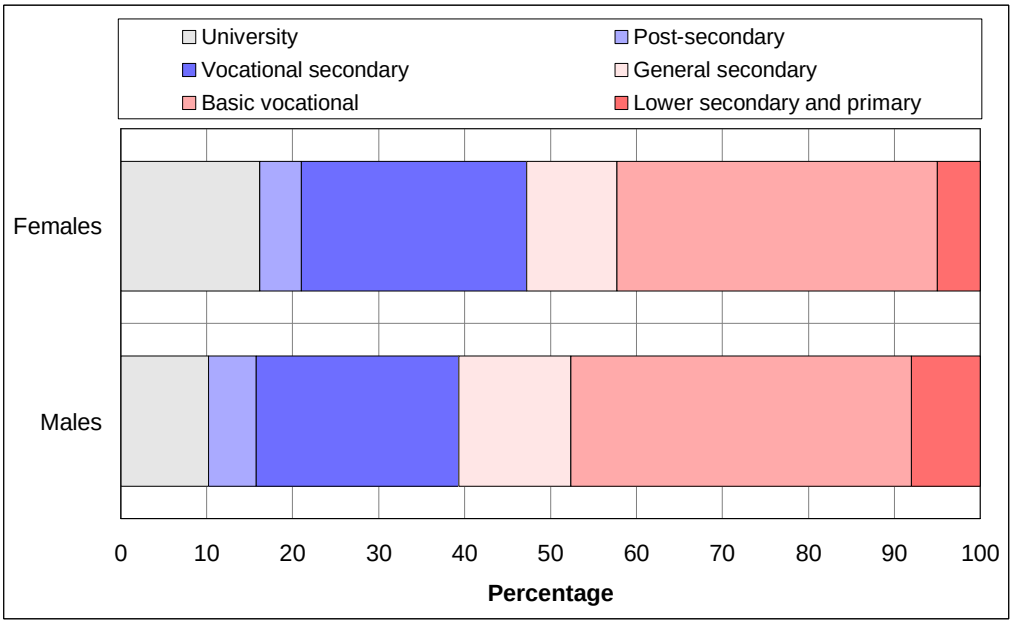
NOTE: Here included unemployed males aged 16-63 and females aged 16-58

SOURCE: The Agency of Statistics of the Republic of Kazakhstan

8.2.3 Unemployed by educational level

The university and secondary vocational education were the most prevalence among unemployed females than males in 2007. The highest proportion of educational level is observed among unemployed in basic vocational education 39.6% for males and 37.2% for females in 2007, and in vocational secondary – 23.6% and 26.6%, respectively. The lowest proportion of educational level among unemployed traced in post-secondary education 5.6% for males and 4.9% for females, lower secondary and primary – 8.0% and 5.0%; general secondary – 13.1% and 10.5%; and university – 10.2% and 16.2%, respectively (see Figure 21).

Figure 21 – Unemployed males and females by educational level in Kazakhstan in 2007 (in %)



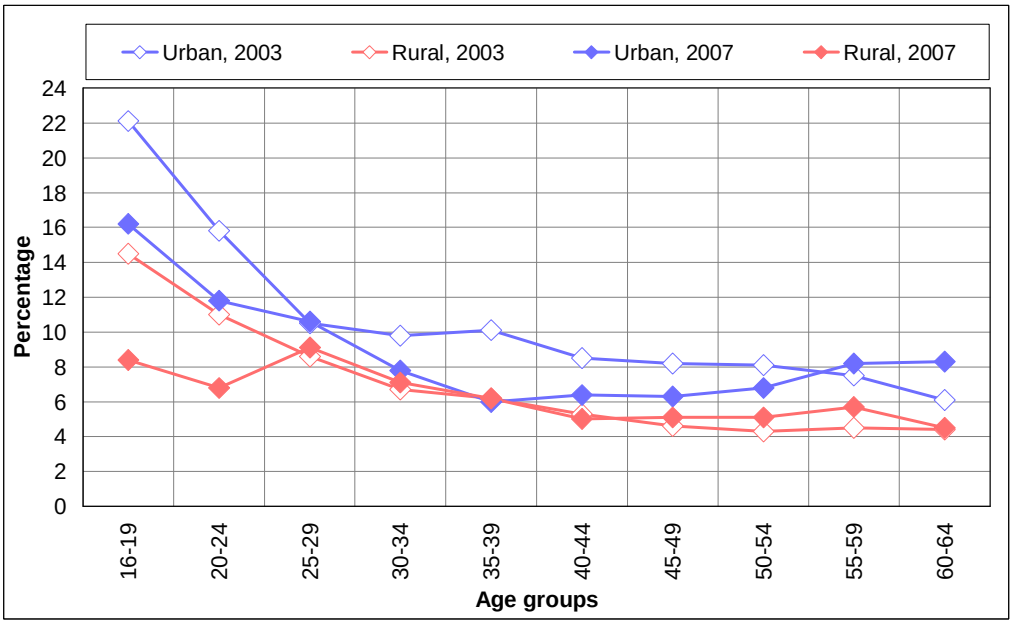
NOTE: Here included unemployed males aged 16-63 and females aged 16-58

SOURCE: The Agency of Statistics of the Republic of Kazakhstan

8.2.4 Urban and rural unemployment rate

The urban and rural unemployment rates were higher in 2003 in comparison with 2007 in Kazakhstan. The urban unemployment rate was 10.3% in 2003 and 8.2% in 2007, and 7.4% and 6.5% in rural areas, respectively. In the Figure 22 we represent the age-specific unemployment rate in urban and rural areas of Kazakhstan in 2007.

Figure 22 – Age-specific unemployment rate in urban and rural areas of Kazakhstan in 2003 and 2007 (in %)



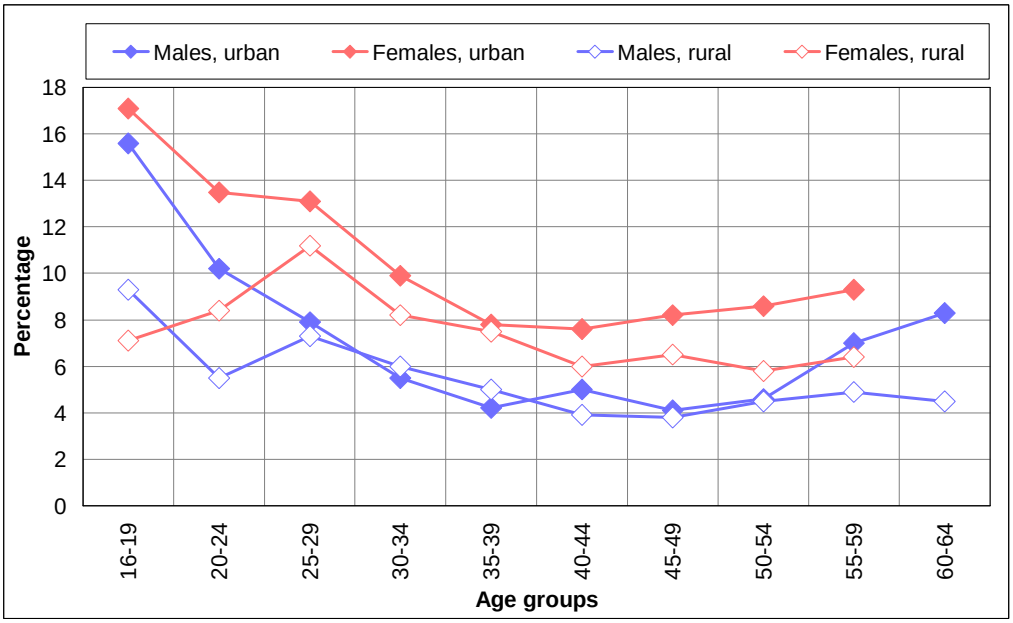
NOTE: Here included unemployed males aged 16-63 and females aged 16-58

SOURCE: The Agency of Statistics of the Republic of Kazakhstan

It should be noted that the unemployment rate is higher in urban areas than in rural. The highest unemployment rate is observed for the youth (aged 16-24) in urban areas than in rural in selected years. For example, in 2003 the urban unemployment rate for 16-19 age groups was 22.1% while rural unemployment rate was equal to 14.5%. Of course, the lowest urban and rural unemployment rate was observed for 60-64 age groups.

The highest urban and rural unemployment rates for all age groups were observed among females than males in 2007. For example, the males' unemployment rate for 25-29 age groups was 7.9% while females' unemployment rate for the same age groups constituted 13.1% in urban area of Kazakhstan in 2007. There is an exception for 16-19 age groups for males and female in rural areas where the rural unemployment rate was higher among males than females. The highest urban and rural unemployment rates for males and females are observed for the youth (aged 16-29) due to the lack of education, unprofessionalism and uncompetitive in the labor market (see Figure 23).

Figure 23 – Age-specific unemployment rates for males and females in urban and rural areas of Kazakhstan in 2007 (in %)



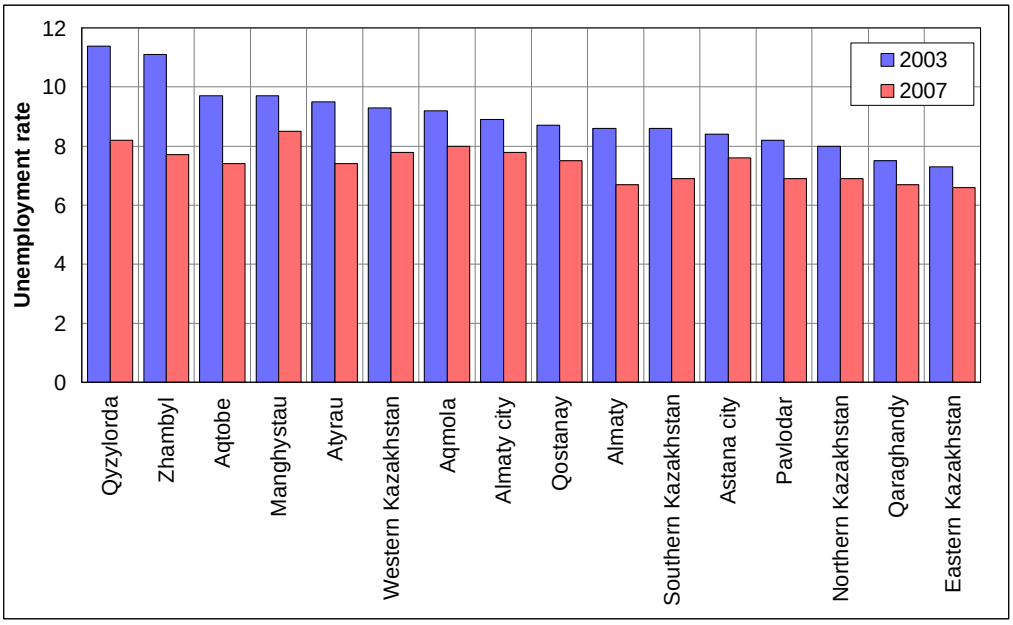
NOTE: Here included unemployed males aged 16-63 and females aged 16-58

SOURCE: The Agency of Statistics of the Republic of Kazakhstan

8.2.5 Unemployment rate by regions

The highest unemployment rate was observed in Qyzylorda, Zhambyl and Manghystau regions of Kazakhstan in selected years, while the lowest unemployment rate was observed in Eastern Kazakhstan and Qaraghandy regions of Kazakhstan. As we noted before, Qaraghandy region is one of the most industrialized regions of Kazakhstan and takes a leading position in the production of coal, ferrous metal, copper and electricity, that is why; the unemployment rate was lower in this region (see Figure 24).

Figure 24 – Unemployment rates by regions of Kazakhstan in 2003 and 2007 (in %)



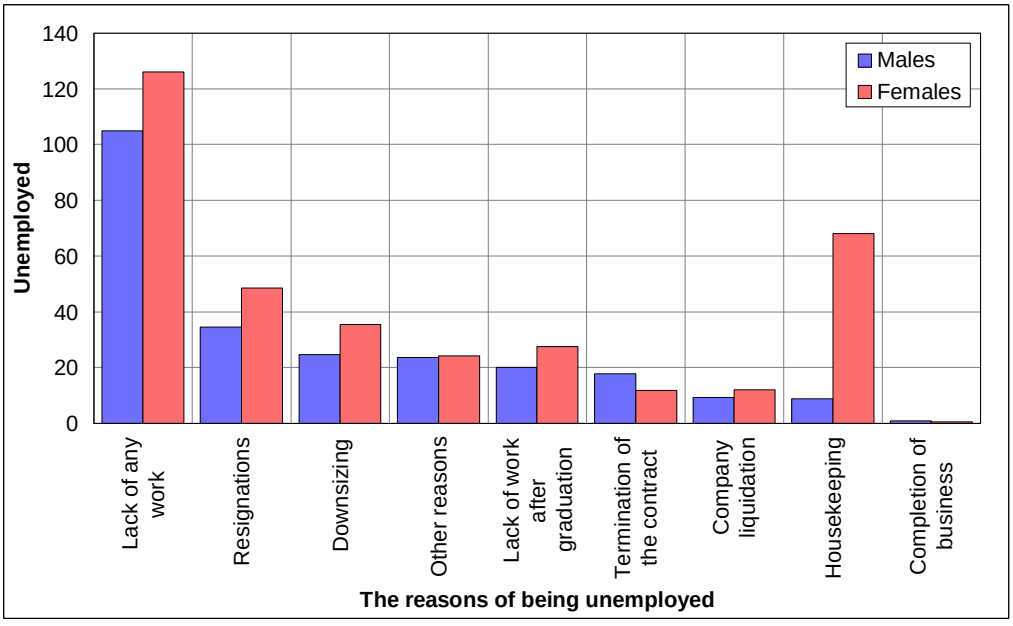
NOTE: Here included unemployed males aged 16-63 and females aged 16-58

SOURCE: The Agency of Statistics of the Republic of Kazakhstan

8.2.6 The reasons of being unemployed

In the Figure 25 we represent the main reasons of being unemployed for males and females of Kazakhstan in 2007.

Figure 25 – Number of unemployed males and females by the main reasons of being unemployed in Kazakhstan in 2007 (in thousand)



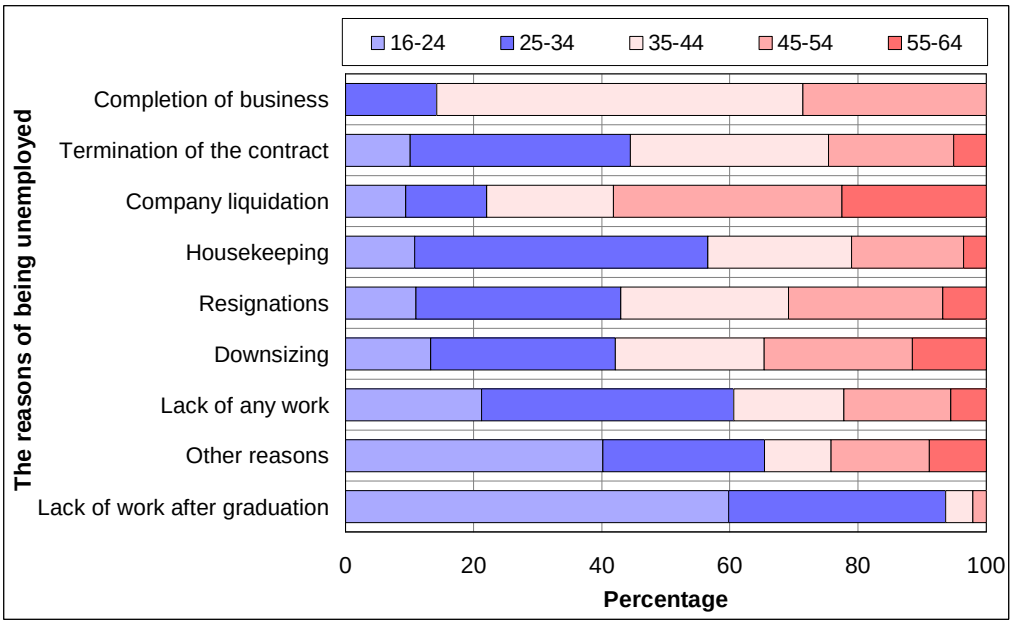
NOTE: Here included unemployed males aged 16-63 and females aged 16-58

SOURCE: The Agency of Statistics of the Republic of Kazakhstan

The main reasons of being unemployed in Kazakhstan was dismissal of employees associated with company (or enterprise) liquidations, staff reductions (or downsizing), resignations, terminations of contract, completion of business, and reasons which are associated with housekeeping, lack of works after graduation, lack of any work and other reasons. The highest number of unemployed males and females can be explained by the lack of any work, resignations, downsizing (or stuff reduction), and the lowest number of unemployed males and females expected due to completion of business and housekeeping. Furthermore, the number of the unemployed females was higher than males for all the reasons of being unemployed, mainly in housekeeping and lack of any work in Kazakhstan in 2007.

The main reasons of being unemployed for the youth (aged 16-24) was the lack of job after the graduation (59.8%); for unemployed who aged from 25 to 34 years old – housekeeping and terminations of contract; for 35-44 age groups – completion of business and terminations of contract; for 45-54 age groups – company liquidation, completion of business and downsizing (or staff reduction); and for 55-64 age groups – company liquidation (see Figure 26).

Figure 26 – Proportion of unemployed by age and the main reasons of being unemployed in Kazakhstan in 2007 (in %)



NOTE: Here included unemployed males aged 16-63 and females aged 16-58

SOURCE: The Agency of Statistics of the Republic of Kazakhstan

To conclude this section it must be noted that economically active population including the employed and the unemployed at the same time distributed unevenly by regions of Kazakhstan. The main findings of this section are: the economic activity rate was higher for males than females, and it was higher for adults than the youth; the employment rate was higher among males than females, and conversely the unemployment rate was higher among females than males. The employment rate was higher among adults than the youth, and conversely the unemployment rate was higher among the youth than adults. The employment rate was higher

among persons who have university degree than persons who have lower secondary or primary education, and conversely the unemployment rate was higher among persons who have lower secondary or primary education than those who have university degree. The employment rate was higher in rural areas than in urban, and conversely the unemployment rate was higher in urban areas than rural during the considered period. It is also important to add that the main reason of being unemployed was the lack of any jobs and housekeeping for females, and terminations of contracts for males.

Chapter 9

Economically inactive population (or not in the labor force)

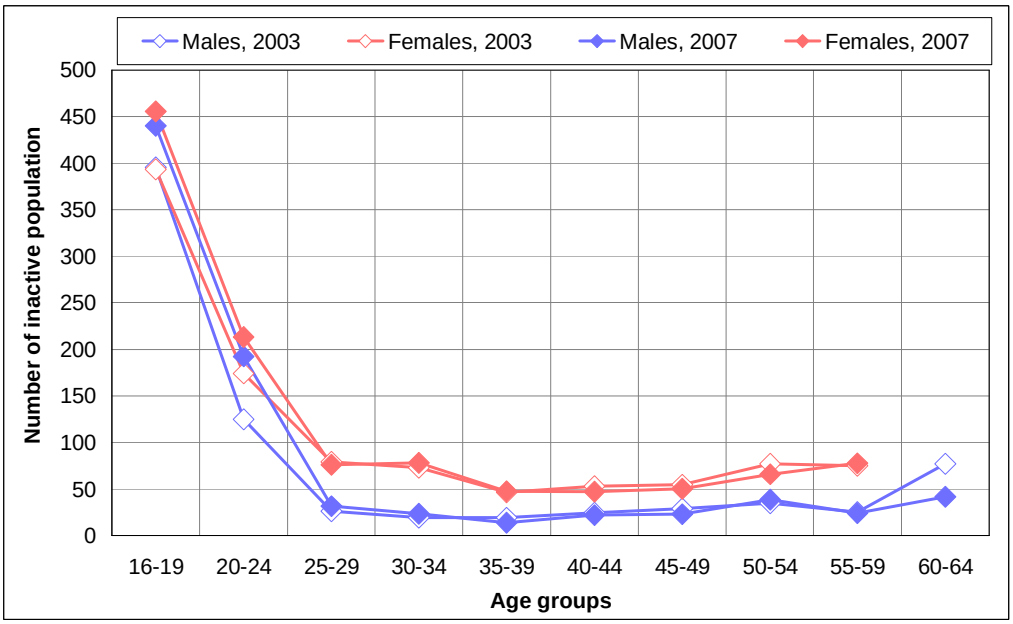
This section will be dedicated to the economically inactive population of Kazakhstan by sex, age, educational level and reasons of inactivity. The economic inactivity rates by age, sex, place of residence and regional dimensions of Kazakhstan will be calculated and analyzed.

9.1 Inactive population by sex and age

As we mentioned before, the economically inactive population consists of all persons who aged from 16 to 63 years for males and form 16 to 58 years for females and who neither classified as employed nor as unemployed during the reference week (Agency of Statistics of the Republic of Kazakhstan 2008a). According to the statistical data of Kazakhstan, in 2007 there were 1,962.0 thousand of working age population who were inactive. It was up from 1,802.2 thousand of working age population in 2003 and represented an increase of 159.8 thousand of working age population or 8%. Among this category of population there were 43.4% of males and 56.6% of females in 2007. Almost in all countries inactive females are more prevalent than males because female are involved more in household duties than males (National Bureau of Statistics in Tanzania 2001).

The number of inactive males and females were higher among the youth (aged 16-24) in comparison with adults (aged 25-64) in selected years. This is primarily due to their participation in education or training which can therefore be considered as positive alternative to labor force activity in the future for Kazakhstan (in effect postponing their labor force entry) (European Commission 2005). For example, in 2007 the proportion of inactivity for the youth (aged 16-24) was accounted for more than 66% of the total inactive population of Kazakhstan, and the lowest proportion (7%) was observed for 35-44 age groups (see Figure 27).

Figure 27 – Inactive population by sex and age in Kazakhstan in 2003 and 2007 (in thousand)



NOTE: Here included economically inactive males aged 16-63 and females aged 16-58

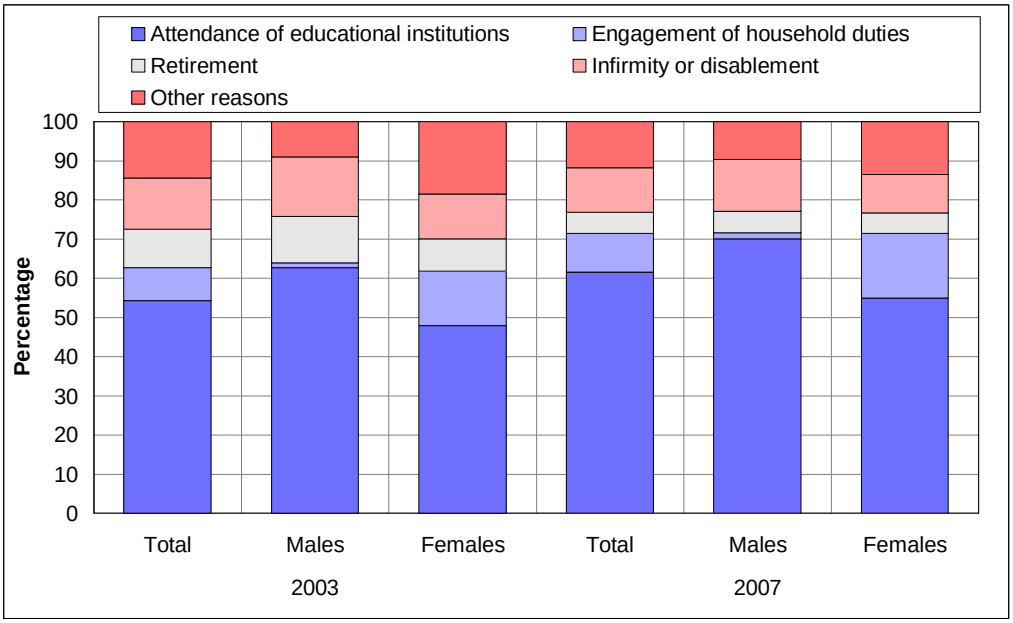
SOURCE: The Agency of Statistics of the Republic of Kazakhstan

9.2 Inactive population by reasons of inactivity

The Labor Force Survey which is conducted by the Agency of Statistics of the Republic of Kazakhstan asks respondents the main reasons they are inactive, with the four largest groups being the sick or disabled, those looking after the family or home, students and retired (Leaker 2009). The main reason for inactivity among working age population of Kazakhstan is education and training, corresponding to 61.5% of inactive population and with a much higher incidence for males than for females (70.1% and 54.9%, respectively) in 2007. However, if the younger age group (16-24) will be excluded, the percentage of the inactive population in education and training falls dramatically (European Commission 2005). Other reasons of population inactivity are infirmity and disablement, at around 11.3% of the inactive population, engagement of household duties (10.0%) and retirement before the state pension age (5.4%). In general, most females are eleven times more likely than males to be looking after home or family, and males are more likely than females to be sick, or disable.

Regarding the “other” reasons of inactivity, this group of inactive population consists of those who gave other reasons for their inactivity or who were unable or unwilling to give a reason (Rogers 2004) and represented 11.9% in 2007. Roughly the same proportion of percentages of population inactivity by reasons of inactivity was observed in 2003 (see Figure 28).

Figure 28 – Proportion of inactive population by sex and reasons of inactivity in Kazakhstan in 2003 and 2007 (in %)



NOTE: Here included economically inactive males aged 16-63 and females aged 16-58

SOURCE: The Agency of Statistics of the Republic of Kazakhstan

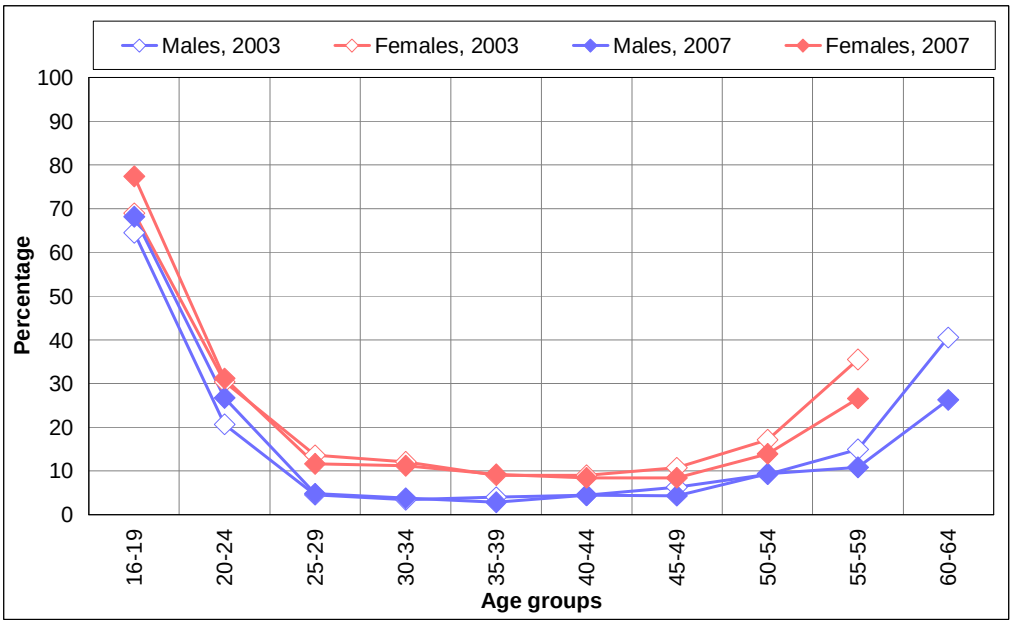
9.3 Economic inactivity rate

The economic inactivity rate is the main indicator of measuring inactivity in the country. It is calculated as a fraction of economically inactive population to the total population. The economic inactivity rate which is graphically shown below looks like a mirror image of the economic activity rate. The economic inactivity rate for working age population of Kazakhstan decreased from 21.5% in 1999 to 19.6% in 2007.

The inactivity rate was higher among females than males in selected years due to females engage in household duties more that males. The males' inactivity rate was around 17.2%, whilst the females' inactivity rate was around 5% pointed higher at 22.3% in 2007. The inactivity rates is higher among the youth (aged 16-24) due to their studies at part-time and full-time educational institutions and older (aged 55-64) due to sickness, disablement or early retirement.

The lowest inactivity rates were observed among adults' males and females who aged from 25 to 54 years old because they have lower probability of being engaged in educational processes, or early retirement, or disablement. We see that the rate of economic inactivity decreased for males for 60-64 age groups and females for 55-59 age groups in 2003 in comparison with 2007. It could be explained by the fact that nowadays many older people in Kazakhstan prefer being employed in order to have better life conditions (see Figure 29).

Figure 29 – Age- specific inactivity rates for males and females in Kazakhstan in 2003 and 2007 (in %)



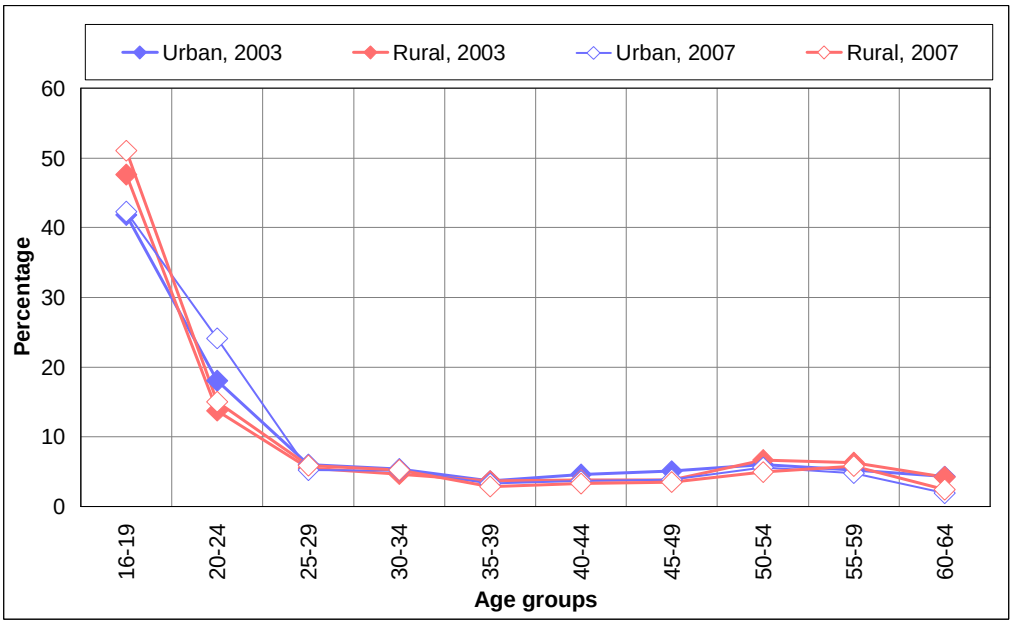
NOTE: Here included economically inactive males aged 16-63 and females aged 16-58

SOURCE: The Agency of Statistics of the Republic of Kazakhstan

9.4 Urban and rural economic inactivity rate

In the Figure 30 we represent the age-specific inactivity rates in urban and rural areas of Kazakhstan in 2003 and 2007.

Figure 30 – Age-specific inactivity rates in urban and rural areas of Kazakhstan in 2003 and 2007 (in %)

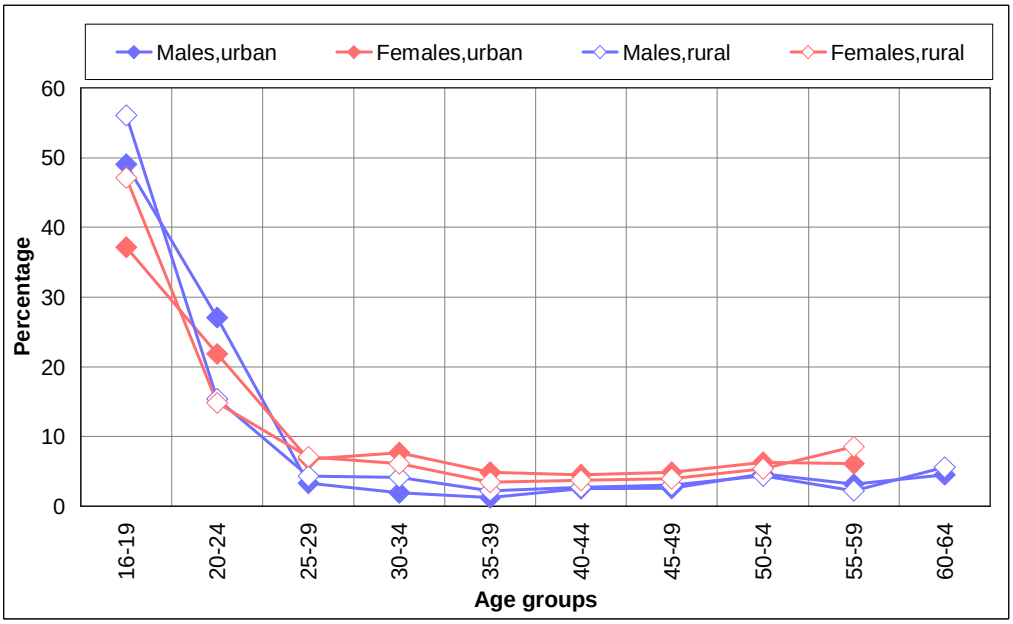


NOTE: Here included economically inactive males aged 16-63 and females aged 16-58

SOURCE: The Agency of Statistics of the Republic of Kazakhstan

The economic inactivity rate in urban areas of Kazakhstan constituted 22.1% in 2003 and 2007 while in rural areas this rate was equal 16.3% in the same periods. The economic inactivity rate was higher in urban areas than in rural due to the location of educational institutions in urban areas of Kazakhstan. By breaking down the inactive population of Kazakhstan by sex in urban and rural areas we see that the proportion of inactive females was higher in urban than in rural areas in selected years because a higher proportion of females in urban areas were engaged in household duties whereas in rural areas most females were absorbed in agricultural activities, fetching water or collection firewood. The proportion of inactive males and females in urban and rural areas in selected years was significantly higher among young people (aged 16-24) due to the participation in education and training processes.

Figure 31 – Age-specific inactivity rates by sex in urban and rural areas of Kazakhstan in 2007 (in %)



NOTE: Here included economically inactive males aged 16-63 and females aged 16-58

SOURCE: The Agency of Statistics of the Republic of Kazakhstan

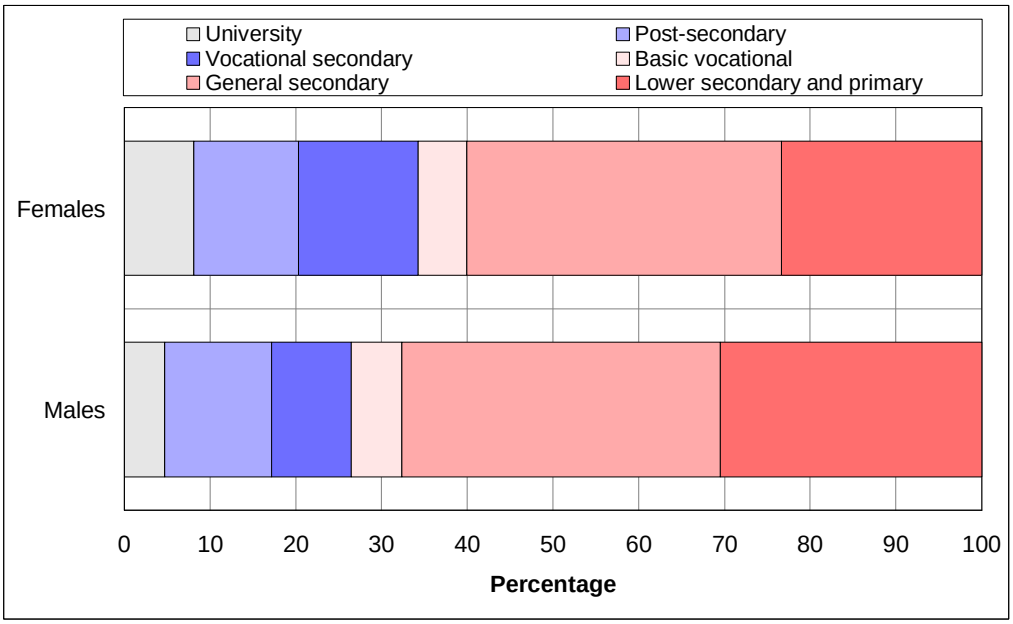
9.5 Inactive population by educational level

In 2007 the highest proportion in the educational level of inactive persons was observed in general secondary (36.9%) and lower secondary and primary (26.6%) educations, and the least proportion was noted in basic vocational (5.7%) and university (6.6%) educations of inactive people.

The inactive females dominated the most on the university and vocational secondary educational levels than inactive males. There is only 4.7% of males (or 39.9 thousand) have university education versus 8.1% of females (or 89.6 thousand). The highest difference between educational levels of inactive people was observed in the lower secondary and primary educations 30.5% of males (or 259.5 thousand) versus 23.3% of females (or 259.2 thousand).

The lowest proportional differentiation was observed in post-secondary, basic vocational and general secondary educations among the inactive males and females (see Figure 32).

Figure 32 – Inactive males and females by educational level in Kazakhstan in 2007 (in %)



NOTE: Here included economically inactive males aged 16-63 and females aged 16-58

SOURCE: The Agency of Statistics of the Republic of Kazakhstan

After the analysis of economically active and inactive population in working age, we see that the hypotheses stating that economically active and inactive population had an increasing tendency during the considered period from 1999 to 2007 is proved. Another hypothesis stating that economic activity and inactivity rates did not depend on sex and age structure of working age population is rejected.

The main findings of the research are: the economic inactivity rate was higher among the youth and older people than adults; the economic inactivity rate was higher among females than males; the economic inactivity rate was higher in urban areas than rural. One of the main reasons of being inactive for males and females is attendance of educational institutions.

To conclude this section, we may add that the information about the size and composition of inactive population which is very important for analysis in assessing potential labor supply for the future. In addition, there has been a greater policy focused on the scope for reducing inactivity, as well as unemployment, as a means of boosting economic performance (UK Office for National Statistics 2008c).

Chapter 10

Working life tables

The main idea of this section is calculation of working life expectancy for males and females of Kazakhstan in 2003 and 2007 using population-based and labor-force-based measurements, and Arriaga's method (temporary working life expectancy between two specific ages). Furthermore, the age-specific rates of accession to and separation from the labor force for males and females in the selected years will be calculated.

10.1 Population-based measurement

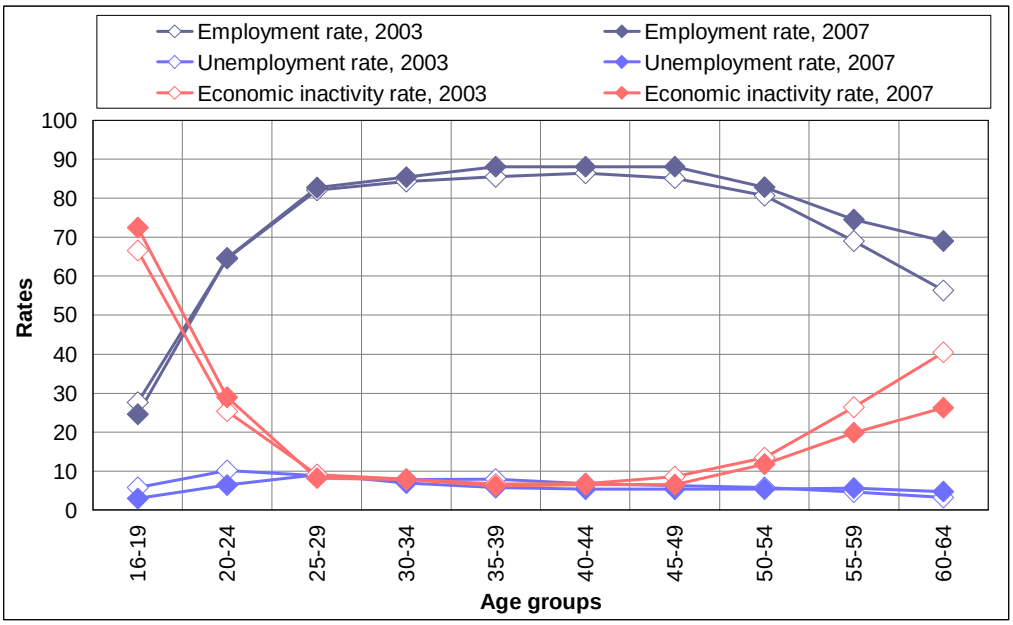
For the calculation of working life tables we need from the number of working age population (males aged 16-63 and females aged 16-58) by categories of employed, unemployed, inactive people and the total population ($P_x^E, P_x^U, P_x^I, P_x^T$), and using this data it is possible to calculate the age-specific employment, unemployment and economic inactivity rates for the population of Kazakhstan. We also took figure connected with the total number of person-years lived between exact age *x+5*, i.e. for complete ages *x, x+4* and *x+5* (L_x) from the official life tables and multiply it by the proportions of working age population by age and categories of employed, unemployed and inactive people in order to find number of working age persons-years in the labor force and not in the labor force ($L_x^E, L_x^U, L_x^I, L_x^T$). For the calculation of the total number of working age persons expected years spend in the labor force and not in the labor force beyond age *x* ($T_x^E, T_x^U, T_x^I, T_x^T$) we assume that all persons who aged 65 years will be in the category of inactive people next year, and using cumulative function we distribute it for all age groups. The expectation of working life for employed, unemployed and inactive population ($e_x^E, e_x^U, e_x^I, e_x^T$) is calculated as typical T_x from the life table.

According to the data from the Agency of Statistics of the Republic of Kazakhstan, the employment rate was higher and unemployment rate was lower in 2007 in comparison with

2003 for all age groups, especially it was the lowest at 45-64 age groups, which can be explained by the favorable economic conditions related to business in the country. The development and extension of small and medium entrepreneurships, reduction of taxes and creation new work places by government and non-government organizations also was a result of increasing employment and decreasing unemployment in Kazakhstan.

The lowest employment rate, and the highest unemployment and economic inactivity rates were observed for the youth (aged 16-24) due to their attendance of educational institutions, on the one hand, and, on the other hand, in order to be competitive and competent to execute the vacant work/position they have not got any experiences, skills and knowledge which are necessary in the labor market. The adults (aged 25-54) had the highest employment rate, and the lowest unemployment and economic inactivity rates because people at these ages have got the higher level of educations, wide of professional skills and experiences which are important in the labor market. In case of older people who aged from 55 to 64 years old, they had the lowest employment rate and the highest rates of being unemployed and inactive due to the closest ages for being retired before the state pension, sick or disabled. Also from the previous sections we know that employment rate was higher among males than females because females could interrupt their employment status due to marriages, child-bearing, or looking after child (see Figure 33).

Figure 33 – Age-specific employment, unemployment and economic inactivity rates for population of Kazakhstan in 2003 and 2007



NOTE: Here included employed, unemployed and inactive males aged 16-63 and females aged 16-58

SOURCE: Author's calculations based on the data from the Agency of Statistics of the Republic of Kazakhstan

The construction of working life tables for population of Kazakhstan using population-based measurement in 2003 and 2007 are shown in the Tables 6 and 7.

Table 6 – Abridged working life table for population of Kazakhstan using population-based measurement in 2003

Age	Number of working age population by categories (in thousand)				Number of working age persons – years in the labor force and not in the labor force between exact age *x* and *x+5*			
	P_x^E	P_x^U	P_x^I	P_x^T	L_x^E	L_x^U	L_x^I	L_x^T
	Employed	Unemployed	Inactive	Total	Employed	Unemployed	Inactive	Total
16-19	327.4	68.0	788.9	1,184,3	107524	22332	259089	388946
20-24	760.3	118.4	299.1	1,177.8	311525	48513	122553	482591
25-29	947.4	101.9	105.5	1,154.8	390911	42045	43531	476487
30-34	978.6	90.7	92.1	1,161.4	394680	36580	37145	468405
35-39	850.2	78.7	65.8	994.7	391735	36261	30318	458314
40-44	981.9	76.7	77.5	1,136.1	384508	30035	30349	444892
45-49	829.0	60.9	83.6	973.5	363007	26667	36607	426282
50-54	670.1	48.3	112.2	830.6	323515	23319	54169	401002
55-59	263.2	17.8	100.5	381.5	253708	17158	96875	367741
60-64	107.5	6.0	77.2	190.7	183444	10239	131738	325421
65-69	-	-	-	-	-	-	-	-

NOTE: Here included employed, unemployed and inactive males aged 16-63 and females aged 16-58

SOURCE: Author's calculations based on the data from the Agency of Statistics of the Republic of Kazakhstan

Table 6 (continued)

Age	Total number of working age persons expected years spend in the labor force and not in the labor force beyond age *x*				Expectation of working life			
	T_x^E	T_x^U	T_x^I	T_x^T	e_x^E	e_x^U	e_x^I	e_x^T
	Employed	Unemployed	Inactive	Total	Employed	Unemployed	Inactive	Total
16	3104556	293151	1618367	5016074	31.86	3.01	16.61	51.47
20	2997032	270818	1359278	4627128	30.90	2.79	14.02	47.71
25	2685507	222305	1236725	4144537	27.98	2.32	12.89	43.18
30	2294596	180260	1193194	3668050	24.27	1.91	12.62	38.79
35	1899916	143679	1156049	3199645	20.48	1.55	12.46	34.50
40	1508182	107418	1125731	2741331	16.67	1.19	12.44	30.30
45	1123674	77383	1095383	2296439	12.87	0.89	12.54	26.30
50	760666	50715	1058775	1870157	9.17	0.61	12.76	22.54
55	437151	27397	1004607	1469155	5.67	0.36	13.02	19.04
60	183444	10239	907731	1101414	2.63	0.15	13.03	15.81
65	0	0	775993	775993	-	-	-	-

NOTE: Here included employed, unemployed and inactive males aged 16-63 and females aged 16-58

SOURCE: Author's calculations based on the data from the Agency of Statistics of the Republic of Kazakhstan

Table 7 – Abridged working life table for population of Kazakhstan using population-based measurement in 2007

Age	Number of working age population by categories (in thousand)				Number of working age persons – years in the labor force and not in the labor force between exact age *x* and *x+5*			
	P_x^E	P_x^U	P_x^I	P_x^T	L_x^E	L_x^U	L_x^I	L_x^T
	Employed	Unemployed	Inactive	Total	Employed	Unemployed	Inactive	Total
16-19	303.7	35.9	895.6	1,235.2	95764	11320	282403	389487
20-24	906.3	90.5	405.4	1,402.2	312295	31184	139694	483174
25-29	1,092.1	119.8	107.6	1,319.5	394312	43255	38850	476417
30-34	1,121.4	90.7	101.8	1,313.9	398265	32212	36154	466631
35-39	881.7	57.2	61.6	1,000.5	400839	26004	28005	454848
40-44	925.7	56.3	68.9	1,050.9	388096	23604	28886	440586
45-49	989.5	60.6	73.4	1,123.5	372208	22795	27610	422613
50-54	734.0	47.3	104.5	885.8	330781	21316	47094	399191
55-59	381.9	29.1	101.6	512.6	274697	20931	73080	368708
60-64	110.1	7.5	41.8	159.4	227757	15515	86469	329741
65-69	-	-	-	-	-	-	-	-

NOTE: Here included employed, unemployed and inactive males aged 16-63 and females aged 16-58

SOURCE: Author's calculations based on the data from the Agency of Statistics of the Republic of Kazakhstan

Table 7 (continued)

Age	Total number of working age persons expected years spend in the labor force and not in the labor force beyond age *x*				Expectation of working life			
	T_x^E	T_x^U	T_x^I	T_x^T	e_x^E	e_x^U	e_x^I	e_x^T
	Employed	Unemployed	Inactive	Total	Employed	Unemployed	Inactive	Total
16	3195015	248137	1622587	5065739	32.74	2.54	16.62	51.91
20	3099251	236817	1340184	4676252	31.91	2.43	13.80	48.15
25	2786956	205632	1200490	4193078	29.01	2.14	12.50	43.64
30	2392643	162377	1161640	3716661	25.34	1.72	12.31	39.37
35	1994379	130165	1125486	3250030	21.62	1.41	12.21	35.25
40	1593540	104161	1097482	2795182	17.77	1.16	12.24	31.18
45	1205443	80557	1068595	2354596	13.94	0.93	12.36	27.23
50	833235	57762	1040985	1931983	10.11	0.70	12.63	23.44
55	502454	36446	993891	1532792	6.52	0.47	12.90	19.90
60	227757	15515	920812	1164084	3.24	0.22	13.12	16.59
65	0	0	834343	834343	-	-	-	-

NOTE: Here included employed, unemployed and inactive males aged 16-63 and females aged 16-58

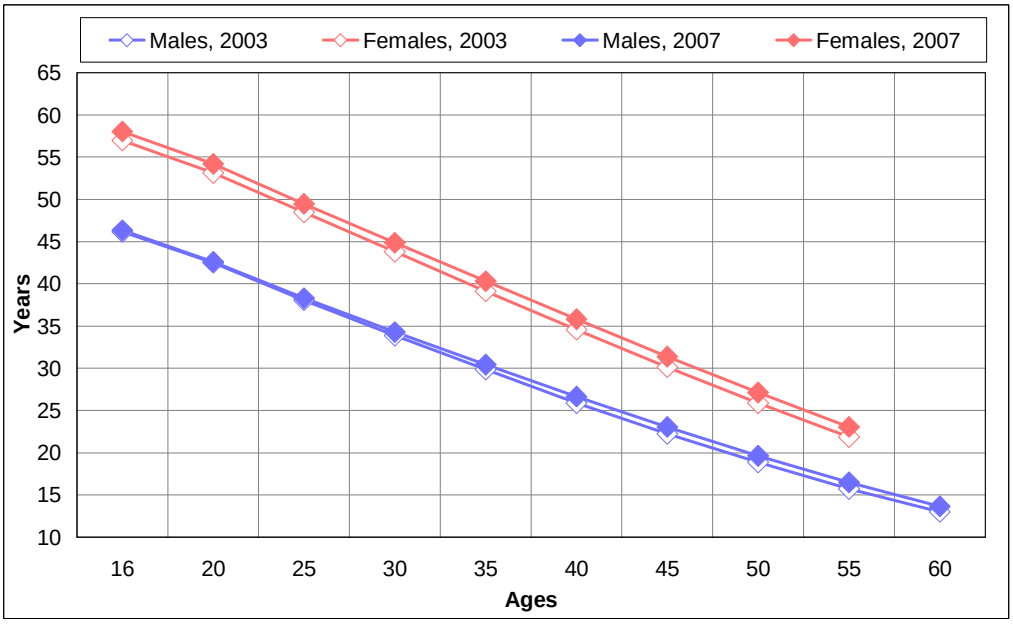
SOURCE: Author's calculations based on the data from the Agency of Statistics of the Republic of Kazakhstan

From the Tables 6 and 7 we see the working life tables for employed, unemployed and inactive working age population of Kazakhstan in 2003 and 2007. For example, the life expectancy for the persons at age 55 was equal 19.04 years in 2003 and 19.90 years in 2007 which means that during the period from 2003 to 2007 the life expectancy increased for 0.86 years due to improvement of health and medical systems in the country. Of these, they spent an average 5.67 years of being employed and 0.36 years of being unemployed in 2003, and 6.52 years and 0.47 years in 2007, respectively. In general, persons at age 55 spent 6.03 years in the labor force and 13.02 years out of it in 2003 while in 2007 they spent 6.99 years and 12.90 years, respectively.

We also see that expectation of working life of being employed and unemployed declines gradually with increasing age, which is the expected pattern. Thus, when persons in the labor force become older, their chances of leaving the labor force increase. This means that the number of years they can be expected to continue working decreases. However, the results shown above reveal not bad careers for the working age population of Kazakhstan (Statistics Sierra Leone 2006).

The difference in life expectancy for males and females was more than 10 years for those people who were at age 16, 20, and 25 years old, and more than 6 years for those persons who were at age 55 years old in 2003 and 2007. The reasons for the difference between males' and females' life expectancy are not fully understood. While some scholars argue that women are biologically superior to men and thus live longer, others argue that men are employed in more hazardous occupations (factories, military service). In addition to this, men generally drive, smoke and drink more than women (Rosenberg 2007) (see Figure 34).

Figure 34 – Life expectancy by age for males and females of Kazakhstan in 2003 and 2007



NOTE: Here included economically active and inactive males aged 16-63 and females aged 16-58

SOURCE: The Agency of Statistics of the Republic of Kazakhstan

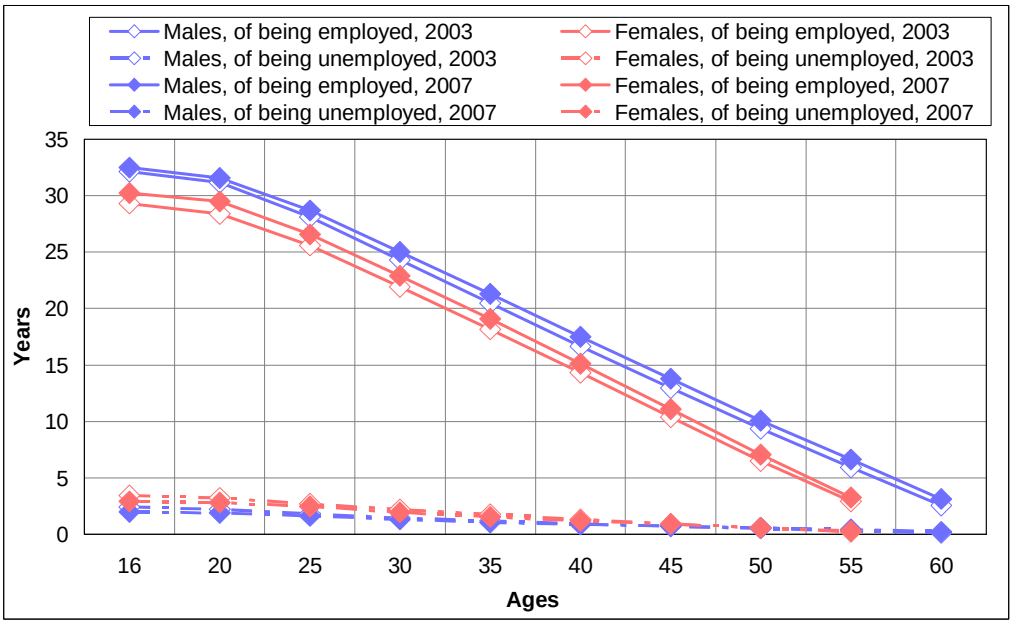
The length of working life expectancy for males aged 16 years shows that the expectation of being employed was 32.14 years and expectation of being unemployed was 2.44 years in 2003, and 32.49 years and 2.01 years in 2007, respectively. The working life expectancy of being employed increased to 0.35 years and the expectation of being unemployed decreased to 0.43 years during the considered period. The expectation of being employed was gradually decreasing to 2.54 years and 0.14 years of being unemployed in the age of 60 years in 2003, and 3.14 years and 0.21 years for the same age in 2007, respectively. Totally, males, who were at age 16 in average spent 34.58 years of being active in the labor force and 11.58 years of being inactive out of it in 2003, and 34.50 years and 11.84 years in 2007, respectively, while older persons who were at age 60 expected to spent 2.69 years of being active and 10.30 years of being inactive in 2003, and 3.36 years and 10.33 years in 2007, respectively.

In case of females aged 16 years old, the expectation of being employed was 29.28 years, and 3.46 years of being unemployed in 2003, and 30.23 years and 2.90 years in 2007, respectively. These expectations are also gradually decreasing as well as for males to 2.90 years of being employed and 0.23 years of being unemployed for females at the age of 55 in 2003, and 3.29 years and 0.29 years for the same age in 2007, respectively. It has to be noted that working life expectancy of being employed is higher in all ages for males than females (Palamuleni 2005). On the one hand, this is because generally males have higher labor force participation rates (or economic activity rates) than females and that is why they have longer length of working life of being employed, and on the other hand, females could leave labor force because of marriage or child-bearing. Females aged 16 years old in average spent 32.73 years of being active in the labor force and 24.25 years of being inactive in 2003, and 33.12 years and 24.92 years in 2007, respectively. The working life expectancy of being unemployed for all ages is higher for females than males in selected years which could be explained by the fact that women could be busy with housekeeping and looking after their children, and therefore, they are more at risk of being unemployed. It is also very important to note that according to the international methodology, people on maternity leave who worked before consider as employed (Official Website of the Czech Republic "AHOJ". Web-site operator: the Ministry of Foreign Affairs of the Czech Republic 2005). People on maternity leave, who did not work before they started maternity leave, and people on next maternity (parental) leave – are classified as unemployed, or persons economically inactive depending on whether they comply or do not comply with the ILO definitions (ibid).

The expectation of being employed for males and females for all ages was higher in 2007 in comparison with 2003 due to the increasing the life expectancy for both sexes, on the one hand, and on the other hand, the favorable economic situation in the country allowed people to do business and be employed. Regarding the expectation of being unemployed for males and females for all ages, it was lower in 2007 in comparison with 2003 due to the

development of small and medium entrepreneurships and creation of new work places for the unemployed (see Figure 35).

Figure 35 – Working life expectancy of being employed and unemployed for males and females of Kazakhstan in 2003 and 2007



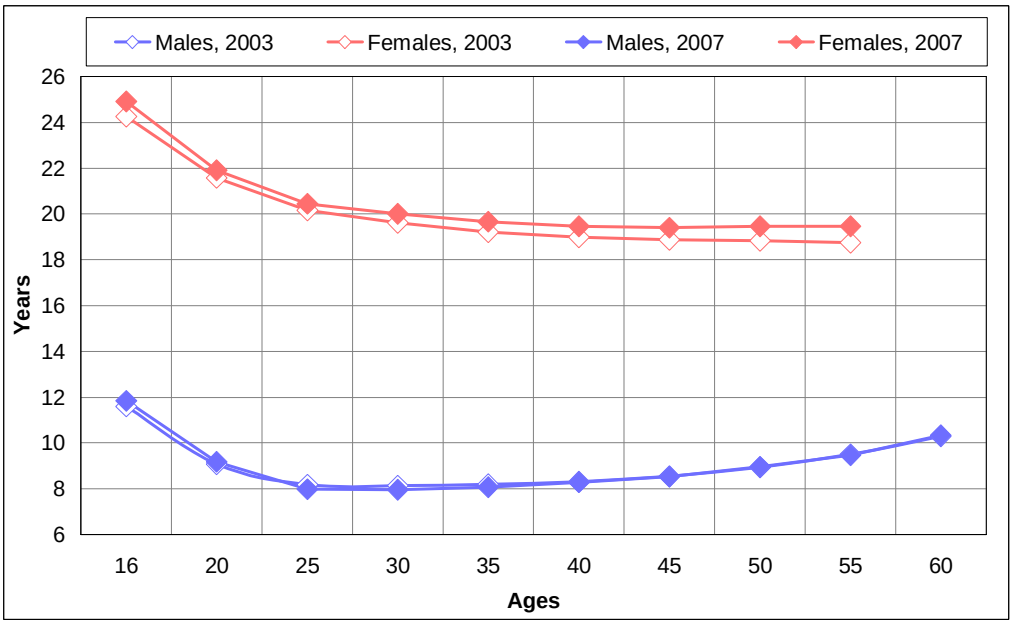
NOTE: Here included employed and unemployed males aged 16-63 and females aged 16-58

SOURCE: Author's calculations based on the data from the Agency of Statistics of the Republic of Kazakhstan

We know from the previous section that economically inactive population includes persons who are not in the labor force, i.e., who are not working and not actively looking for job during the reference period (Swe-Hock 2007). The more important categories in inactive population are those who do housework without payment, students, unpaid voluntary social workers, mentally or physically disabled persons, persons deriving their income from rent, dividends, interest and so forth, and all others not engaged in economic activities (ibid). In Kazakhstan, boys who aged from 17 to 29 years old could be awaiting call-up for national service, they are considered as inactive people (ibid). The economically inactive persons could be those who had worked before and might re-enter the labor force in the future, mainly students and females on maternity or parental leave, would not have worked before and would enter the labor force for the first time in subsequent years (Swe-Hock 2007). That is why, it is very important to calculate the average life expectancy of being inactive for males and females separately.

The length of life expectancy of being inactive is higher for females than males because main reasons of being inactive are the attendance of educational processes, an engagement of household duties and existence of discourage workers who believe that there is no job available for them, for example, females more often think that they have lower educational level or work experience in comparison with males. Thus, the life expectancy of being inactive for males at age 16 was 11.59 years while females at the same age had 24.25 years in 2003, and 11.84 years and 24.29 years in 2007, respectively (see Figure 36).

Figure 36 – Life expectancy of being inactive for males and females of Kazakhstan in 2003and 2007



NOTE: Here included economically inactive males aged 16-63 and females aged 16-58

SOURCE: Author's calculations based on the data from the Agency of Statistics of the Republic of Kazakhstan

10.2 Labor-force-based measurement

The labor-force-based measurement of the expectation of working life refers to the average number of years to be spent in the labor force above in a given exact age for each person in the labor force at that age (Kintner 2004).

The age-specific activity rates (or age-specific labor force participation rates) in 2003 and 2007 were calculated in the section 8 and presented in the Figure 9. The males' and females' age pattern of activity rate is unimodal. The age-specific activity rates start from a low value in the age group 16-19, and then it increases with rising age groups up to 35-39, declines gradually reaching a low value in age group 60-64 in selected years. The females' age-specific activity rates were lower for all ages in comparison with males' age-specific activity rates due to the interruption of working activity in the labor force (marriage, child-bearing).

For the further calculation of abridged working life tables for males and females we have to find the maximum age-specific activity rates for both sexes. For instance, the highest age-specific activity rates were observed for males at age 30 and constituted 0.96564, and for females at age 35 and constituted 0.90985 in 2003 which means that there were 96 active males at age 30 per 100 males, and 90 active females at age 35 per 100 females. Using the labor-force-based measurement of construction working life tables we see that males who were at age 16 expected to spend 39.28 years of being active while females for the same age expected to spend 40.27 years in 2003, and 39.54 years and 40.78 years in 2007, respectively (see Tables 8, 9, 10 and 11).

Table 8 – Abridged working life table for males of Kazakhstan using labor-force-based measurement in 2003

Age	Age-specific activity rate	The highest age-specific activity rate	Survivors at exact age x out of 100,000 born alive and active	Stationary economically active population	Economically active person years that would be lived after age x	An average number of economically active years expected to be lived
	$w(x)$	$w(x)`$	$l_w(x)$	$L_w(x)`$	$T_w(x)`$	$e_w(x)$
16	0.35481	0.96564	93742	376819	3735055	39.28
20	0.79332	0.96564	93124	465818	3358235	35.52
25	0.95411	0.96564	91718	455766	2892416	31.03
30	0.96564	0.96564	89647	441355	2436650	26.68
35	0.96003	0.96003	86514	424229	1995295	22.54
40	0.95521	0.95521	82820	397152	1571066	18.42
45	0.93744	0.93744	76933	372892	1173913	14.58
50	0.90791	0.90791	68853	323522	801020	10.91
55	0.85091	0.85091	57719	281362	477497	7.35
60	0.59517	0.59517	34513	196135	196135	4.51

NOTE: Here included economically active (i.e., employed and unemployed) males aged 16-63

SOURCE: Author's calculations based on the data from the Agency of Statistics of the Republic of Kazakhstan

Table 9 – Abridged working life table for females of Kazakhstan using labor-force-based measurement in 2003

Age	Age-specific activity rate	The highest age-specific activity rate	Survivors at exact age x out of 100,000 born alive and active	Stationary economically active population	Economically active person years that would be lived after age x	An average number of economically active years expected to be lived
	$w(x)$	$w(x)`$	$l_w(x)$	$L_w(x)`$	$T_w(x)`$	$e_w(x)$
16	0.31144	0.90985	88838	355533	3577218	40.27
20	0.69616	0.90985	88739	442548	3221685	36.31
25	0.86347	0.90985	88252	439713	2779136	31.49
30	0.87943	0.90985	87608	436133	2339423	26.70
35	0.90963	0.90985	86811	431566	1903289	21.92
40	0.90985	0.90985	85754	425252	1471723	17.16
45	0.89305	0.89305	82689	408356	1046470	12.65
50	0.82901	0.82901	74722	366654	638113	8.54
55	0.64525	0.64525	55838	271458	271458	4.86

NOTE: Here included economically active (i.e., employed and unemployed) females aged 16-58

SOURCE: Author's calculations based on the data from the Agency of Statistics of the Republic of Kazakhstan

Table 10 – Abridged working life table for males of Kazakhstan using labor-force-based measurement in 2007

Age	Age-specific activity rate	The highest age-specific activity rate	Survivors at exact age x out of 100,000 born alive and active	Stationary economically active population	Economically active person years that would be lived after age x	An average number of economically active years expected to be lived
	$w(x)$	$w(x)`$	$l_w(x)$	$L_w(x)`$	$T_w(x)`$	$e_w(x)$
16	0.31910	0.97167	94473	376819	3735055	39.54
20	0.73302	0.97167	93848	465819	3358236	35.78
25	0.95243	0.97167	92314	455766	2892417	31.33
30	0.96169	0.97167	89827	441355	2436651	27.13
35	0.97167	0.97167	86630	424229	1995296	23.03
40	0.95549	0.95549	81560	397152	1571066	19.26
45	0.95658	0.95659	77224	372893	1173914	15.20
50	0.90639	0.90639	67940	323523	801021	11.79
55	0.89145	0.89145	60170	281363	477498	7.94
60	0.73776	0.73777	43112	196135	196135	4.55

NOTE: Here included economically active (i.e., employed and unemployed) males aged 16-63

SOURCE: Author's calculations based on the data from the Agency of Statistics of the Republic of Kazakhstan

Table 11 – Abridged working life table for females of Kazakhstan using labor-force-based measurement in 2007

Age	Age-specific activity rate	The highest age-specific activity rate	Survivors at exact age x out of 100,000 born alive and active	Stationary economically active population	Economically active person years that would be lived after age x	An average number of economically active years expected to be lived
	$w(x)$	$w(x)`$	$l_w(x)$	$L_w(x)`$	$T_w(x)`$	$e_w(x)$
16	0.22643	0.91572	89690	358273	3657893	40.78
20	0.68749	0.91572	89427	446073	3299620	36.90
25	0.88420	0.91572	88977	443303	2853547	32.07
30	0.88765	0.91572	88284	439117	2410244	27.30
35	0.90687	0.91572	87328	433845	1971128	22.57
40	0.91572	0.91572	86157	427127	1537283	17.84
45	0.91478	0.91479	84525	417731	1110155	13.13
50	0.86090	0.86091	77592	381425	692424	8.92
55	0.73379	0.73379	63762	310999	310999	4.88

NOTE: Here included economically active (i.e., employed and unemployed) females aged 16-58

SOURCE: Author's calculations based on the data from the Agency of Statistics of the Republic of Kazakhstan

If we compare working life expectancy of being active for males and females based on population and labor-force measurements we see that the expectation of being active for males and females was higher when we used labor-force measurement because we chose the maximum age-specific activity rate and distributed it for all younger ages.

According to the population-based measurement, males at age 16 were expected to spend 34.50 years in the labor market and 39.54 years of being economically active using labor-force measurement in 2007, and 33.12 years and 40.78 years for females, respectively. Using labor-force measurement the females' working life expectancy was higher at ages 16, 20, 25, 30 and 35 in comparison with males'. In author's opinion, it could be explained by the fact that males had the maximum age-specific activity rate earlier at age 35 while females – at age 40 in 2007 (see Figure 37).

Figure 37 – Differences in working life expectancy for males and females of Kazakhstan based on population and labor-force measurements in 2007

NOTE: Here included economically active (i.e., employed and unemployed) males aged 16-63 and females aged 16-58
SOURCE: Author's calculations based on the data from the Agency of Statistics of the Republic of Kazakhstan

10.3 Temporary life expectancy

For the analysis and calculation of temporary working life expectancy for working age population we used E.E. Arriaga's method, and population based measure approach. In our case we study about the working age population who aged from 16 to 64 years old; that is why for the calculation of temporary life expectancy we chose initial age of 16 and final age of 64. We can calculate the average number of years that a group of persons alive at exact age *x* will be in the labor force form 16 to 63 years old for males and from 16 to 58 years old for females in 2003 and 2007.

The results of calculation of temporary working life expectancy for males and females in 2003 and 2007 represent in the Table 12. In general, we see that the total temporary working life expectancy was higher in 2003 in comparison with 2007. But it is very important to consider the temporary working life expectancy for males and females separately through the categories of employed, unemployed and inactive population. In average males spent 32.98 years in the labor force of being active including 30.62 years of being employed, 2.36 years of being unemployed and 5.44 years of being inactive (out of labor force) while females in average spent totally 29.96 years of being active in the labor force (26.71 years of being employed and 3.25 years of being unemployed), and 7.67 years of being inactive in 2003. The main reasons for interruption of females' working life are marriage, pregnancy, looking after child.

Table 12 – Temporary males' and females' working life expectancy in 2003 and 2007

Sex	2003				2007			
	Employed	Unemployed	Inactive	Total	Employed	Unemployed	Inactive	Total
Total	29.98	2.90	7.29	40.17	27.82	2.24	9.92	39.98
Males	30.62	2.36	5.44	38.42	30.60	1.88	5.63	38.11
Females	26.71	3.25	7.67	37.63	27.31	2.64	7.64	37.59

NOTE: Here included economically active and inactive males aged 16-63 and females aged 16-58

SOURCE: Author's calculations based on the data from the Agency of Statistics of the Republic of Kazakhstan

10.4 Accession to and separation from the labor force

One practical use of working life table is the estimation of the annual accession to, and separation from, the actual working population based on the assumptions that the population subjected to the age-specific death rates and the age-specific activity rates used to construct working life tables. According to the article written by Willekens (1980), the separation from the labor force could be due to mortality and retirement.

From the Tables 13 and 14 below we see that the total accession to the labor force was higher in 2007 in comparison with 2003 due to entering baby-boom generation of 1980s into the labor force, and constituted 818 males and 795 females in 2003, and 894 and 859 in 2007, respectively. The highest accession to the labor force was observed among the youth who aged from 16 to 24 age groups, that is why, we can assume that they are students who will leave their educational institutions next year and enter the labor force as a new hires. It is also very important to note that the number of males who access to the labor force in selected years was higher than the number of females.

In case of separation from the labor force, we see that the number of males and females who separate from the labor force was higher in 2003 in comparison with 2007, mainly due to retirement. The males' and females' separation from the labor force due to retirement took the prevalence position comparing with the separation due to mortality in selected years.

Table 13 –* W*orking age population and its estimated accessions to and separations from the labor force by age in 2003 (per 1000 persons)

Age	Males				Females			
	Accession to the labor force	Separation from the labor force	Separation from the labor force due to mortality	Separation from the labor force due to retirement	Accession to the labor force	Separation from the labor force	Separation from the labor force due to mortality	Separation from the labor force due to retirement
	$A(x)$	$M^{w}(x)$	$M_{\delta}^{w}(x)$	$M_{r}^{w}(x)$	$A(x)$	$M^{w}(x)$	$M_{\delta}^{w}(x)$	$M_{r}^{w}(x)$
16-19	625	-	-	-	555	-	-	-
20-24	142	-	-	-	162	-	-	-
25-29	37	-	-	-	36	-	-	-
30-34	13	-	-	-	21	-	-	-
35-39	-	9	8	1	13	-	-	-
40-44	-	15	11	4	9	-	-	-
45-49	-	22	16	6	-	20	5	14
50-54	-	34	22	12	-	52	8	43
55-59	-	86	31	55	-	206	12	194
60-64	-	222	44	177	-	-	-	-
Total	818	387	132	255	795	277	26	251

NOTE: Here included economically active and inactive males aged 16-63 and females aged 16-58
SOURCE: Author's calculations based on the data from the Agency of Statistics of the Republic of Kazakhstan

Table 14 –* W*orking age population and its estimated accessions to and separations from the labor force by age in 2007 (per 1000 persons)

Age	Males				Females			
	Accession to the labor force	Separation from the labor force	Separation from the labor force due to mortality	Separation from the labor force due to retirement	Accession to the labor force	Separation from the labor force	Separation from the labor force due to mortality	Separation from the labor force due to retirement
	$A(x)$	$M^{w}(x)$	$M_{\delta}^{w}(x)$	$M_{r}^{w}(x)$	$A(x)$	$M^{w}(x)$	$M_{\delta}^{w}(x)$	$M_{r}^{w}(x)$
16-19	586	-	-	-	629	-	-	-
20-24	198	-	-	-	191	-	-	-
25-29	61	-	-	-	20	-	-	-
30-34	28	-	-	-	8	-	-	-
35-39	21	-	-	-	5	-	-	-
40-44	-	13	11	2	5	-	-	-
45-49	-	20	15	5	-	17	5	12
50-54	-	28	21	7	-	36	7	29
55-59	-	45	29	16	-	205	11	194
60-64	-	243	45	199	-	-	-	-
Total	894	350	121	229	859	258	23	235

NOTE: Here included economically active and inactive males aged 16-63 and females aged 16-58
SOURCE: Author's calculations based on the data from the Agency of Statistics of the Republic of Kazakhstan

The proportion of the separation from the labor force for males due to mortality was 34.5% and 65.5% due to retirement, and for females was 8.9% and 91.1% in 2007, respectively. These data show that males are more prone to leave labor force due to mortality than females whereas females are more prone to leave labor force due to retirement than males. The separation from the labor force is higher among older people due to the closest age of retirement (Palamuleni 2005).

To conclude, during our research, the working life tables for males and females of Kazakhstan in 2003 and 2007 based on population-based and labor-force-based measurements of calculation average working life expectancy, and temporary working life expectancy using Arriaga's method were calculated. The study indicates that males who survive at 16 years old were expected to live 46.17 years in 2003, out of which 34.59 years are expected to be spent in active status, and the remaining 11.59 years considered as inactive years. Similar values for females are 56.99 years, 32.74 years and 24.25 years, respectively. Using the data on the economic activity of population in Kazakhstan in 2007, these values for males are 46.34 years, 34.50 years and 11.84 years and for females are 58.04 years, 33.12 years and 24.92 years, respectively. The hypothesis stating that working life expectancy was higher for males than females in 2003 and 2007 is proved.

Furthermore, the study has shown that the accession to the labor force is up to the age of 40 among the youth while the separation from the labor force starts from the age of 40 and the intensity is lower than that of the accession. The separation from the labor force is higher due to retirement rather than mortality (ibid). The main finding of research is that females are found out of the labor force more often due to retirement, and conversely males leave the labor force more often because of the higher mortality rates. With this statement we rejected our last hypothesis stating that there were no any differences in the reason of separation from the labor force for males and females during the considered period.

Chapter 11

Conclusion and discussion

The working age population is very important category of population because they are responsible for the supporting children and older people. Children under age 15 generally rely on their parents or guardians to support them financially, while the older members of the population count on government assistance and pension to provide for them financially throughout retirement. A portion of the working population's income goes to dependents, whether through income and taxes (Burkot 2009).

The working age population of Kazakhstan covers males at the age of 16 to 63 completed years old and females at the age of 16 to 58 completed years old. The working age population is divided into economically active (i.e., employed and unemployed, or labor force) and inactive (i.e., not in the labor force) population. The economically inactive population consists of all persons who neither classified as employed nor as unemployed during the reference week. Among the important categories of the inactive population are those who are attendant of educational institutions, engage of household duties, retired before the state pension, sick and disable, unpaid voluntary social workers, mental and charitable institutions, persons deriving their income from rent, dividend, and interest are also included in the economically inactive population. The size of working age population as well as the size of active and inactive population increased during the investigating period from 1999 to 2007.

During our research we calculated economic activity, employment, unemployment and economic inactivity rates for the working age population, and the main findings of the research are: the economic activity and employment rates were higher among males than females, and conversely, the unemployment rate was higher among females than males; the economic activity and employment rates were higher among adults than the youth, and conversely, the unemployment rate was higher among the youth than adults; the economic activity and employment rates was higher among persons who have university education than persons who have lower secondary or primary education, and conversely, the unemployment rate was higher among persons who have lower secondary or primary education than persons who have university degree; the economic activity and employment rates were higher in rural areas than in

urban ones, and conversely, the unemployment rate was higher in urban areas than rural ones; the economic inactivity rate was higher among the youth and older people than adults; the economic inactivity rate was higher among females than males; the economic inactivity rate was higher among those people who had lower secondary and primary education, and lower for those who had university degree; the economic inactivity rate was higher in urban areas than rural ones. One of the main reasons of being unemployed for females was lack of any jobs and housekeeping, and for males the terminations of contracts whereas the main reason of being inactive for males and females is attendance of educational institutions.

In author's opinion, the importance and value of this master thesis was the calculation of working life tables for the working age population (males aged 16-63 and females aged 16-58) of Kazakhstan. Using population-based and labor-force-based measurements we calculated the expectations of working life, and using Arriaga's method we found out the temporary life expectancy (life expectancy between two specific ages) for males and females of working age by categories of employed, unemployed and inactive. As a result we see that males spend more years of being active in the labor force than females, and conversely, females spend more years of being unemployed and economically inactive because of interruption working life due to marriage, child-bearing, looking after family/home. The working life expectancy for males and females increased in 2007 in comparison with 2003.

The accession to the labor force is up to the age of 40 among the youth while the separation from the labor force starts from the age of 40 and the intensity is lower than that of the accession. The separation from the labor force is higher due to retirement rather than mortality. Females are found out of the labor force more often due to retirement whereas males leave the labor force more often because of the higher mortality rates.

Regarding the discussion of research questions we can tell the following:

1. *How did the size of working age population change during the considered period from 1999 to 2007?*

During the considered period, the size of working age population (males and females aged 16-64) increased from 9.6 million people in 1999 to 10.5 million people in 2007. Mainly it was contributed by entering the baby-boom generations who were born in the beginning of 1980s to the labor force.

2. *What were the trends of economically active and inactive population during 1999–2007? Did they increase or decrease?*

The trends of economically active and inactive population increased as well as the trend of working age population during the 1999-2007.

3. *Did the economic activity and inactivity rates depend on sex and age structure of working population during the considered period?*

The economic activity and inactivity rates depended on sex and age structure of working population during the considered period. If the economic activity rate was higher

among males than females due to the fact that females could interrupt employment status by marriage or child-bearing, the economic inactivity rate was higher for females than males because one of the reasons of being inactive is engagement in household duties.

According to the age, the economic activity rate was higher for adults (aged 30-54) due to their professional skills and experiences which are important in the labor market whereas the economic inactivity rate was higher among the youth (aged 16-24) due to attendance of educational institutions, and older people (males aged 60-64 and females aged 54-59) due to the closest age of being retired.

4. *Were there any differences in working life expectancy according to sex in 2003 and 2007?*

The males' working life expectancy was higher than females' in selected years due to the interruption working life because of marriage, child-bearing, looking after family/home. For example, males who were at age 16 expected to spend 34.50 years in the labor force in 2007 while females expected to spend 33.12 years of being active at the same age.

5. *Were there any differences in the reason of separation from the labor force for males and females during the considered period?*

The demographers, sociologists, economists and other scientists have identified two main reasons of separation from the labor force, the first, due to retirement, and the second one, due to mortality. During the considered period, we observed that females are found out of the labor force more often due to retirement whereas males leave the labor force more often because of higher mortality rate in comparison with females.

To conclude, despite the increase of the size of working age population who aged from 16 to 64 years old almost by 1.0 million people the intensity of labor force participation remained pretty stable during the considered period in Kazakhstan.

Chapter 12

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